

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE <div style="text-align: center;">J</div>		PAGE OF PAGES <div style="display: flex; justify-content: space-between;"><div>1</div><div>2</div></div>	
2. AMENDMENT/MODIFICATION NO. <div style="text-align: center;">0003</div>		3. EFFECTIVE DATE <div style="text-align: center;">01-Jun-2004</div>		4. REQUISITION/PURCHASE REQ. NO. <div style="text-align: center;">W22W9K-4084-7256</div>		5. PROJECT NO.(If applicable) <div style="text-align: center;">ZHTV963204</div>	
6. ISSUED BY U. S. ARMY ENGINEER DISTRICT, LOUISVILLE 600 DR. MARTIN LUTHER KING, JR. PLACE ROOM 821 LOUISVILLE KY 40202-2230		CODE <div style="text-align: center;">W912QR</div>		7. ADMINISTERED BY (If other than item 6) MILITARY/RESERVE TEAM 600 DR. M. L. KING, JR. PL., RM 821 ATTN: TOM E. DICKERT LOUISVILLE KY 40202-2230		CODE <div style="text-align: center;">DACA27</div>	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W912QR-04-R-0020	
				X		9B. DATED (SEE ITEM 11) 26-Apr-2004	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Solicitation W912QR-04-R-0020, D/B Consolidated Fire/Crash Rescue Station Project, Wright-Patterson Air Force Base, Ohio is amended as follows: See Attached Summary of Changes							
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
				TEL: _____ EMAIL: _____			
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 01-Jun-2004	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

AMENDMENT 0003

SUMMARY OF CHANGES

1) Section 01010 (Amdt #0002) and Section 01020 (Amdt #0002) are hereby deleted and replaced with the attached Section 01010 (Amdt #0003) and Section 01020 (Amdt #0003).

(End of Summary of Changes)

SECTION C-01010**PROJECT SYNOPSIS****PART 1 - GENERAL**

1.1 Provide all labor, equipment, supplies, consultant services and materials to design and construct a 35,725 s.f. Consolidated Fire/Crash Rescue Station (Main Fire Station). The project will include facilities for new standardized Air Force fire station with modifications noted herein. The purpose of the project is to replace the existing Main Fire Station in Area C and the flight line station in Building 206. The new facilities will include an Apparatus Room, Fire Station Supply Storage, Operation Support Space, Administration, Training, a Base Communications Center, Living Areas, Recreation, and Dining Facility. The Apparatus Room shall be designed to accommodate all Wright-Patterson Air Force Base crash and structural fire vehicles in a 7 bay (14 stall) arrangement. Fire Station Supply storage shall be provided for fire fighting agents, hoses, fire extinguishers, self-contained breathing apparatus (SCBA), protective-clothing, laundry and tire storage. The Administration and Training Center will include, educational training, physical fitness areas, and administration areas for offices; chief's bedroom, restrooms and storage. Residential and Living Areas for the 21 fire fighters per shift shall be provided with private bedrooms, personal closets, restrooms/showers, and laundry. Space for television viewing, quiet study, day room, kitchen, kitchen storage, serving, vending, and dining area shall all be provided. The project also includes new driveway(s), parking facilities, fencing, connection to existing utilities, removal of existing concrete aircraft apron, and demolition of existing buildings 11405, 20090, 30201, and 30206 (fire station vehicle single bay addition). There is a requirement for a crash response access road for the flight line to be constructed. The construction of this access road will be phased separately and must be coordinated with airfield operations. See drawings for construction limits. Utility connections and extensions include but are not limited to electrical service, domestic water, fire protection, sanitary & storm sewer, communications systems, cable TV, gas service and steam and condensate piping. Not required in the programming for the Main Fire Station is US Air Force Reserve Command / Air National Guard component as outlined in the Air Force Fire Station Design Guide. The new building and parking lots will be required to meet current Force Protection standoff requirements. The Contractor will be required to prepare original drawings using a CADD System (as defined in Section 01021) and shall supply a record of the as-built drawings on magnetic media in Microstation format to the Government at the completion of the project.

BID OPTIONS - Refer to Section 01020, paragraph 1.1.12 FOR REQUIREMENTS.

1.2 Construction Phasing requirements are outlined in Specification Section 01020 GENERAL DESIGN REQUIREMENTS.

1.3 RFP DOCUMENTS

1.3.1 These RFP documents set forth the parameters for the development of a full and complete design.

1.3.2 These RFP documents are provided as a performance standard. The Contractor is required to independently prepare and submit for approval a complete Design. The Contractor's Design Professionals shall independently confirm and be responsible for the technical accuracy and adequacy of all aspects of the design.

1.3.3 Where conflicts or question arise regarding the application of the requirements outlined in the contract documents, the following order of precedence shall apply:

- RFP specification section 01020
- RFP specification section, 01021
- RFP specification section 01010
- UFGS Guide Specifications
- RFP Drawings
- WPAFB Base Facility Standard
- Air Force Fire Station Design Guide

1.3.4 The RFP documents are intended to define the functional and aesthetic project Design/Build requirements. The contractor is responsible for the design and coordination necessary to provide a complete and useable facility in accordance with the RFP requirements. The RFP documents are not intended to be construction documents. It is expected that the contractor will investigate the RFP requirements and independently further develop the design to sufficiently prepare a proposal. The Contractor shall involve their subcontractors (including their designer) in the preparation of the proposal.

1.4 PROPOSAL REQUIREMENTS

1.4.1 Respondents to this Request for Proposal (RFP) must provide sufficient data and detail in their proposal, as indicated in Section 00115 of this solicitation.

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1.5 UTILITIES

1.5.1 Unless noted otherwise in this solicitation, respondents shall assume that adequate utility capacities for power, communications, gas, **steam**, communications, cable TV, water, sanitary sewer, and storm sewer are available at the site to support the facility. Upgrading the existing utilities (unless noted otherwise) outside the limits of construction is not a part of this project.

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1.6 CODES AND STANDARDS

1.6.1 Comply with the applicable latest state, local and National Codes & Standards, requirements of product manufacturers, authorities having

jurisdiction and requirements of these RFP documents in the preparation of the project final design and construction. The latest edition of the Codes and Standards applicable to this project include, but are not limited to (where there are discrepancies between codes the most stringent requirement shall apply) the following:

- Wright-Patterson Base Facility Standard
- Air Force Fire Station Design Guide (replace references to the UBC with the current IBC)
- UFC 1-200-01 Design: General Requirements
- UFC 3-600-01 Fire Protection
- International Building Code (IBC) **2000**
- NFPA 13
- NFPA 72
- NFPA 101, Life Safety Code 2003
- ASHRAE Fundamentals Handbook
- ASHRAE Standard 62 **and 90.1**
- International Plumbing Code
- International Mechanical Code
- National Electrical Code
- Occupational Safety and Health Act (OSHA) - applicable standards and regulations of the latest edition
- Asphalt Institute Standards
- American Concrete Institute (ACI)
- Architectural Woodwork Institute (AWI)
- American National Standards Institute (ANSI)
- American Welding Society (AWS) "Structural Welding Code"
- American Water Works Association (AWWA)
- American Society for Testing and Materials (ASTM)
- NFPA 75
- Americans with Disabilities Act Accessible Guidelines (ADAAG)

Where there are conflicts between the Base Facility Standard and any building code, the building code will govern.

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1.7 SPECIFICATIONS

1.7.1 The RFP is intended to provide minimum standards for quality of materials and construction. The RFP shall be used by the Design/Build Contractor as the basis for development of a comprehensive specification

*** Amendment #0001**

1.7.2 The UFGS specifications shall be used for this project. The D/B contractor shall select the appropriate master specification sections for editing as is appropriate for the design prepared. The UFGS master specifications ensure a level of quality expected in Military Construction and, in many cases, exceed what is required for a merely functional project. The Government has included these requirements for a number of reasons, including better efficiency, longer life, less maintenance, etc. Guide specification paragraphs describing materials and equipment that are to be used on this project, as well as the associated installation, execution, and general requirement paragraphs, shall be retained verbatim in the final

specifications. Paragraph numbering shall not be altered. Inapplicable paragraphs shall be replaced with the words "Not Used" while retaining the paragraph number. UFGS specifications may be obtained from the Louisville District Corps of Engineers website at <http://www.lrl.usace.army.mil/ed/>. The UFGS master specification shall be modified where applicable to comply with the requirements of the WPAFB Base Facility Standard. *** Amendment #0001**

1.7.3 The Design/Build Contractor shall provide a final typed copy of United Facilities Guide Specifications (UFGS) for the design. Where applicable, the contractor shall use the Louisville District Corps of Engineers version of the guide specifications (LRL version). The guide specifications shall be edited within the technical guidelines of the specifications only. Substitutions outside these technical guidelines are not acceptable without prior approval of the contracting officer.

1.8 USE OF THE PROJECT SITE

1.8.1 Contractor shall have use of the project site for execution of the work as defined in the requirements of *Construction Considerations and Use of Premises* outlined in Section 01020. Entrance into and interface with the surrounding facilities shall be coordinated in advance with the Contracting Officer. The project site is "secured" within the fenced boundaries of the Base. Access will require advance notice and security passes at all times.

1.9 SAFEKEEPING OF PRODUCTS AND MATERIALS

1.9.1 Contractor shall assume full responsibility for protection and safekeeping of products and materials stored on the site under this Contract.

1.10 AS-BUILT DRAWINGS

1.10.1 Contractor shall provide as-built drawings (electronic file) to the Contracting Officer. Refer to Paragraph 1.9 AS-BUILT DOCUMENTS FOR DESIGN BUILD PROJECTS in Section 00800 and the Base Facility Standard for specific requirements.

1.11 PERMITS

1.12.1 Contractor is required to investigate, submit for any permits necessary for the design and construction of this facility. All permit applications shall be submitted to the Contracting Officer Representative; refer to Section 01020 for environmental permitting requirements (Contractor will pay all permit fees).

1.12 SHOP DRAWING REVIEW AND APPROVAL

1.12.1 Contractor's "Designer of Record" shall be required to review and approve all shop drawings that are required by the design.

1.12.2 Submittals for shop drawings shall be in accordance with Section 01331. Government will review these submittals for compliance with the contract.

PART 2 - DESCRIPTION OF RFP PROCESS**2.1 GENERAL**

2.1.1 This project will be designed and constructed by a single firm or team of firms (the Contractor), that has registered architects and engineers employed by or subcontracted to their organization. The Contractor is responsible for the design and construction whether the Contractor uses architects and engineers from within his organization or subcontracts with an outside Architect/Engineer firms(s) for design services.

2.1.2 An outline description of the Design-Build (DB) process follows:

2.2 PROPOSAL PHASE

2.2.1 The Proposal Phase includes that time from announcement of the project through the selection process and the final award of the contract to the successful Offeror.

2.2.2 To be considered for selection, respondent must submit all required documents as specified in Section 00115.

2.2.3 The Corps of Engineers will evaluate the proposals and will award the contract to a single Offeror based upon criteria, which is outlined in Section 00130 (Proposal Evaluation Criteria).

2.3 DESIGN & CONSTRUCTION PHASE

2.3.1 Refer to specification section 01021 for information regarding the requirements during design and construction.

PART 3 - PROJECT SCHEDULE**3.1 GENERAL**

3.1.1 The Contractor shall complete the entire work ready for use as stated in Section 00800.

3.1.2 As part of the Proposal, Offerors shall submit schedule. See section 00115.

3.1.3 The schedule must allow 21 days after receipt for Government review of each design submittal. If the submittal arrives on Friday or a weekend, the review time starts on the following Monday. Sufficient time should be included in the schedule for mailing, a review meeting at Wright-Patterson AFB, correction of the documents by the contractor and backcheck of the corrections by the Government and the contractor together, at each design submittal.

3.1.4 The contractor must ensure that all elements of his team concur in the design and in responses to comments before being submitted to the Government

for review. Delays because sub-contractors do not agree with the design or comment responses will be the Contractor's responsibility.

3.2 SUMMARY LIST OF MAJOR MILESTONE EVENTS DURING DESIGN & CONSTRUCTION

1. Contract Award/Design Notice to Proceed (NTP).
2. Submit Design Quality Control Plan.
3. Predesign/build Meeting and Voluntary Partnering Workshop.
4. Conduct Design Charette
5. Submit Part 1 Uncorrected Final Design.
6. Receive Government Review Comments.
7. Conduct Review Meeting.
8. Distribute comments, responses and meeting minutes.
9. Make design corrections/revisions to design.
10. Part 1 100% Design Backcheck.
11. Submit Part 1 Certified 100% Design.
12. Part 1 Construction NTP.
13. Submit Part 2 Uncorrected Final Design.
14. Receive Government Review Comments.
15. Conduct Review Meeting.
16. Distribute comments, responses and meeting minutes.
17. Make design corrections/revisions to design.
18. Part 2 100% Design Backcheck.
19. Submit Part 2 Certified 100% Design.
20. Part 2 Construction NTP.
21. Project Substantial Completion

END OF SECTION

SECTION 01020

GENERAL DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS:

1.1.1 The basic requirements for this facility are outlined in the ***Air Force Fire Station Design Guide*** (included as part of this RFP). ***Section 01020 GENERAL DESIGN REQUIREMENTS*** is intended to supplement and modify the requirements of the ***Air Force Fire Station Design Guide*** as appropriate for this specific installation.

1.1.2 Provide all labor, equipment, supplies, consultant services and materials to design and construct a 35,725 s.f. Consolidated Fire/Crash Rescue Station (Main Fire Station). The project will include facilities for new Air Force fire station with modifications noted herein. The purpose of the project is to replace the existing Main Fire Station in Area C and the flight line station in Building 30206. The new facilities will include an Apparatus Room, Fire Station Supply Storage, Operation Support Space, Administration, Training, a Base Communications Center, Living Areas, Recreation, and Dining Facility. The Apparatus Room shall be designed to accommodate all Wright-Patterson Air Force Base crash and structural fire vehicles in a 7 bay (14 stall) arrangement. Fire Station Supply storage shall be provided for fire fighting agents, hoses, fire extinguishers, self-contained breathing apparatus (SCBA), protective-clothing, laundry and tire storage. The Administration and Training Center will include educational training, physical fitness areas, and administration areas for offices; chief's bedroom, restrooms and storage. Residential and Living Areas for firefighters shall be provided with private bedrooms, personal closets, restrooms/showers, and laundry. Space for television viewing, quiet study, dayroom, kitchen, kitchen storage, serving, vending, and dining area shall all be provided. **The requirement for vehicle maintenance as outlined in the Fire Station Design Guide is NOT required for this project.** The project also includes new driveway(s), parking facilities, fencing, connection to existing utilities, removal of existing concrete aircraft apron, and demolition of existing buildings 11405, 20090, 30201, and 30206 (fire station vehicle single bay addition only). See drawings for construction limits. Utility connections and extensions include but are not limited to electrical service, domestic water, fire protection, sanitary & storm sewer, communications systems, cable TV, gas service and steam and condensate piping. Not required in the programming for the Main Fire Station is US Air Force Reserve Command / Air National Guard component as outlined in the *Air Force Fire Station Design Guide* and the vehicle maintenance area. The new building and parking lots will be required to meet current Force Protection standoff requirements.

1.1.3 This facility shall comply with all requirements stated herein, including the *Air Force Fire Station Design Guide, Base Facility Standards* (included as

part of this RFP). Design and construction shall not exceed the maximum gross area for individual spaces and the entire building as outlined in the documents Programming Matrix.

1.1.4 Contractor will have full access and use of the project site defined by the construction limits (see drawings). All project requirements (building, parking, access, site amenities, etc.) must be constructed within the construction limits. Site layout and construction shall comply with the requirements of Section 01020, Part 5 - Antiterrorism Force Protection Construction Requirements. In particular, the contractor should note the required standoff distances for design and construction.

* Amendment #0001

1.1.5 All aspects of this project, including but not limited to, the RFP requirements, demolition of facilities, extension, interface, relocation and connection of all required utilities, and all necessary site demolition and development are included in this Design/Build contract. * Amendment #0001

1.1.6 Site survey, Site Utility Plan, a building module plan within the Air Force Fire Station Design Guide, construction limit drawings, and attached programming schedule are provided as guidance in outlining the project development requirements. The Contractor will be fully responsible for preparing independently developed 100% complete design documents.

1.1.7 All items listed in Section 01020 - *GENERAL DESIGN REQUIREMENTS* are included to define the scope of the complete design and construction requirements for this contract. The Contractor is responsible to develop a complete design, sufficient to fulfill the requirements of this RFP. Refer to SECTION 01021, DESIGN SUBMISSION REQUIREMENTS AFTER AWARD for design submittal requirements.

1.1.8 Information included in this RFP is provided as general guidance for design, construction and quality. It shall be the Design/Build Contractor's responsibility to verify the accuracy of the information provided.

1.1.9 Affirmative Procurement is defined as the process of purchasing environmentally preferable products, especially products manufactured from recycled and reclaimed materials. The United States Environmental Protection Agency (USEPA) has designated 54 guideline items in the Comprehensive Procurement Guideline (CPG) III for mandatory procurement. These CPG products are products that are or can be made containing recycled materials. A current detailed listing of these products and recycled content requirements can be found on USEPA's web site at <http://www.epa.gov/cpg/products.htm>. In the CPG, the USEPA organizes these items into 8 product categories as follows:

1. Construction Products
2. Landscaping Products
3. Non-paper Office Products
4. Paper and Paper Products
5. Park and Recreation Products
6. Transportation Products
7. Vehicular Products
8. Miscellaneous Products

1.1.9.1 The Design/Build Contractor is required to research, propose, and utilize these designated products, and any other recycled-content products available in the market place. CPG products with the highest percentage of

recovered materials practicable shall be utilized, unless otherwise specified, or if one or more of the following exemptions apply:

1. Does not meet appropriate performance specifications.
2. Is not available competitively (from two or more sources).
3. Is not available within a reasonable time frame.
4. Is only available at an unreasonable price.

1.1.9.2 The contractor shall certify that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by applicable specifications or other contractual requirements, and shall also estimate the percentage of total material utilized for the performance of the contract which is recovered material. If CPG products are not utilized, the contractor shall provide written explanation and documentation as to why the products were not used.

1.1.10 The Contractor shall comply with a LEED's (Leadership in Energy and Environmental Design) checklist during development as per the U.S. Green Building Council's Green Building Rating System.™ A "certified" building is not required. The LEED project checklist includes the following sections and shall be filled-out by the Contractor:

1. Sustainable Sites
2. Water Efficiency
3. Energy & Atmosphere
4. Materials & Resources
5. Indoor Environmental Quality
6. Innovation & Design Process

Contractor shall make every effort to salvage 50% of the building materials from the demolition of buildings included as part of this work.

1.1.11 Provide a main mechanical room for the project. Service access, aesthetics, functional considerations, code and force protection requirements shall each be addressed to the satisfaction of the Government in the design and construction of the space(s). In addition, design and construct a diesel fuel generator and three (3) day tank with screening outside the building. Refer to Part 6 of Section 01020 for mechanical systems requirements.

1.1.12 Bid Options: Provide the following Bid Option Items:

- BID OPTION #1 - EMERGENCY GENERATOR: See paragraph 2.16.4.3 for requirements.
- BID OPTION #2 - CCTV SYSTEM: See paragraph 7.4.4 for requirements
- BID OPTION #3 - CRASH RESCUE VEHICLE ACCESS PAVING: See paragraph 2.6.2 and 2.85 for requirements
- BID OPTION #4 - WINDOW BLINDS: See paragraph 3.4.7.1 for requirements.

1.2 AIRFIELD OPERATIONS

1.2.1 The Air Force AICUZ program is intended to reduce the potential for aircraft mishaps in populated areas. Three safety zones are designated at the end of all active runways: Clear Zone, APZ I and APZ II. The Clear Zone represents the most hazardous area. The proposed site for the new Fire Station is located outside of all APZs.

1.2.2 The new Fire Station will be located immediately adjacent to active taxiway "B". The Design/Build Contractor will be required to coordinate his activities closely with the Contracting Officer and secure the construction area. The limits of the construction area are shown on the drawings. The Design/Build Contractor will be required to repair any damage created as a result of construction activities to the aircraft-parking apron or taxiway. Contractor will be required to coordinate construction equipment placement, access and use on the site due to the close proximity to the taxiway. Construction activities shall not impair access to Buildings 30145 and 30206.

1.2.3 Accomplish all construction work on the taxiways and parking aprons with extreme care regarding the operation of aircraft. Cooperate closely and coordinate with the Airfield Manager and the Contracting Officer. Park equipment in an area designated by the Contracting Officer. Under no circumstances shall equipment be parked overnight or for any extended period of time in the proximity of taxiways. Leave no material in areas where extreme care is to be taken regarding the operation of aircraft.

1.2.4 Schedule work to conform to aircraft operating schedules. The Government will exert every effort to schedule aircraft operations so as to permit the maximum amount of time for the Contractor's activities; however, in the event of emergency, intense operational demands, adverse wind conditions, and other such unforeseen difficulties, the Contractor shall discontinue operations at the specified locations in the aircraft operational area for the safety of the contractor, military personnel and the Government. Submit a schedule of work that will impact the operation of the parking apron or taxiway to the Contracting Officer. Describe the work to be accomplished, location of the work, noting distances from the taxiways, buildings and other structures as necessary. Provide dates and hours the work is to be accomplished. Keep the approved schedule of work current and notify the Contracting Officer of any changes prior to beginning each day's work.

1.2.5 During daylight, mark stationary and mobile equipment with FAA / AF approved, international orange and white-checkered flags, mark the materials and work with yellow flags.

* Amendment #0001

1.2.6 During nighttime, which begins 2 hours before sundown and ends 2 hours after sunrise, mark stationary and mobile equipment, materials with FAA / AF approved markers and the work with red flashing lights. When directed by the Contracting Officer the red lanterns will be turned off or color of the globes changed. *Amendment #0001

1.2.7 Open only those trenches for which material is on hand and ready for placing therein. As soon as possible after the material has been placed and work approved, backfill and compact trenches as specified.

1.2.8 The Contractor is advised that aircraft operations will produce extremely high noise levels and will induce vibrations in the pavements, structures and equipment in the vicinity of the airfield. This may result in high velocity flying debris in the area. The Contractor shall be responsible for providing all necessary ear protective and other safety devices for his personnel, for insuring protection of his equipment, and for scheduling the work to eliminate hazards to his personnel and equipment and to prevent damage to work performed by him.

1.2.9 Obtain an approved Work Clearance Request (AF Form 103) prior to the start of excavation, digging or work that disrupts aircraft flow, vehicular traffic flow, utility services or routine airfield operations activities.

1.2.10 Airfield Manager will provide necessary battery powered radios, including one radio for the tower. During work within the taxiway area, an operator will be available for radio contact with the tower at all times. Radio frequency shall be approved by the tower. Radios requirements will be provided by and briefed by the Airfield Manager.

* Amendment #00011.3 CONSTRUCTION PHASING1.3.1 The project consists of three separate components as follows:

- Phase 1 - New Fire Station, installation of airfield access gate on north side of Building 30206 & personnel vehicle parking lot.
- Phase 2 - Airfield Fire Crash Rescue Access Path
- Phase 3 - Demolition of Buildings 11405, 20090, 30201 & 30206 (Partial).

1.3.2 Coordinate the timing of construction of the Airfield Fire Crash Access Path with the Contracting Officer. Work shall be performed at dates and times as specified by the Contracting Officer. Pay special attention to Airfield Operations requirements when planning and executing this work.

1.3.3 Construction of the new 30-foot vehicle access gate at the north end of Building 30206 shall be completed as the first item of construction under this contract. The contractor shall coordinate the exact location of the new gate and fencing with the Contracting Officer. Demolish existing fence as required to accommodate the new gate location. Repair holes or damage to the existing paving from removals as required.

1.3.4 The new Fire Station construction shall be complete before the demolition of Buildings 11405, 20090, 30201 & 30206 (partial) can commence. The sequence of building demolition shall be as follows:

- Building 11405, 20090 & 30201 shall be demolished first.
- Building 30206 (partial) shall be completed last. * Amendment #0001

PART 2 - SITE REQUIREMENTS***2****2.1 EXISTING SITE CONDITIONS*** Amendment #0001

2.1.1 The project-building site is located along Skeel Avenue. The site is bounded on the north by building 30206, the south by building 30145. the East by Skeel Ave and the West by the furthest western edge of building 30145, facing the flight line. The new building, parking lots, access driveways, sidewalks, etc. will be located in this area. Refer to paragraph 2.3 for site restrictions. The site is relatively flat and currently incorporates lawn and a concrete aircraft-parking apron (aircraft parking spaces F1-F12). Underground utilities are prevalent in this area. The airfield is protected by flight line fence adjacent to a lawn area. The new airfield crash response access path will be routed from the new fire station, westward, across the existing concrete aircraft-parking apron to Taxiway "B". Although most of this path extends across existing concrete apron, the far-west portion will require widening of the asphalt taxiway shoulder. In addition to the principal building site and crash response access path, demolition of buildings 11405, 20090, 30201, and 30206 (partial) is required. * Amendment #0001

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2.1.2 Existing site information is provided for the Contractor's preliminary use in developing definitive design information for his proposal. Existing utility locations are plotted based on a topographic survey and existing utility plans. Contractor shall verify existing site topography and utilities prior to beginning any work on the site. The graphic scales on the civil drawings are approximate. If it is necessary to scale the drawings, use an engineer's scale. Properly plotted full size drawings scale at 1"=60'.

2.1.3 Prior to commencing subsurface excavation or fence removal, a Base Civil Engineering Work Clearance Request (AF Form 103) will be required. To obtain AF Form 103 all locations for digging will need to be clearly numbered or identified. In conjunction with AF Form 103, a clearance meeting will be required to clear the identified locations.

2.1.4 A Geotechnical Assessment of the site has not been performed. For bidding purposes, assume an allowable bearing capacity of 2,500 psf for the primary building site. The Contractor is responsible for performing a complete geotechnical investigation. The following information shall be provided in the D/B contractor's investigation:

- a. Recommended pavement designs for drainage, thickness, subgrade preparation and compaction requirements.
- b. Recommended foundation types, confirm allowable bearing pressure and bearing elevation.
- c. Recommended lateral earth pressure values for the design of retaining walls.
- d. Water table depth and solutions related to groundwater problems.
- e. Recommended subgrade compaction/preparation and subgrade reaction (k) for building slab on grades.
- f. Provide the site classification in accordance with Table 3-1 of TI 809-04; or site class as defined in Table 1615.1.1 in the 2003 IBC.

2.1.5 The primary site is located within the well field protection zone. Contractor shall comply with all Base and Ohio EPA Standards in regard to the storage of chemicals.

2.2 SITE DEMOLITION

2.2.1 Demolition and removal of the existing concrete apron, asphalt pavement, curbs, sidewalks and utilities is required as part of this project. Demolition may include but is not limited to the following:

- Asphalt Pavement
- Concrete curbs (& gutters)
- Concrete apron (approximately 15-inches thick)
- Chain link fence
- Existing storm sewer and drainage structures
- Existing water main, fire main, water services, fire hydrants, valves and appurtenances
- Existing sanitary sewer, manholes, and cleanouts
- Existing High Temperature Steam supply and return lines, Condensate Pressure Return lines, Vacuum Return lines, and appurtenances
- Existing underground and overhead electric conduits and cables, CATV, poles, manholes, transformers, switches and related equipment
- Communication conduits, cables and manholes
- Trees and vegetation

* Amendment #0001

2.2.2 Remove all apron striping (including striping for aircraft parking spaces F5 through F12) as required for new building, parking lot, and crash response access road. * Amendment #0001

2.2.3 Adjust manholes to grade as required.

2.2.4 If possible, existing trees on the site should be retained and used as part of the overall site and landscape development plan.

2.2.5 Demolition activities shall be sequenced so that the flight line remains secure at all times. Temporary fence and/or gates shall be utilized as required to secure the flight line.

2.2.6 Remove curb and grass on the Southeast corner of Building 30206 until it's flush with the South face of the facility. This driveway entrance will be reworked as part of the fire station development. Maintain access to garage door on South side of Building 30206 throughout construction.

2.2.7 Remove 90 degree chain link fence corner on the Northwest side of the steam pit that is Northeast of Building 30145.

2.2.8 All pavement to be removed shall be sawcut, preferably at existing control joints.

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2.3 BUILDING LOCATION

* Amendment #0001

2.3.1 The new fire station shall be generally located as follows: The Western limits of the new building shall be located a minimum of 100-ft from the western North/South taxiway through airplane parking area "F" (taxiway between F1/F4 and F5/F8). The Northern limits of the new building shall be located a minimum of 50-ft from existing Building 30206. The contractor shall reconfigure the existing gate at the south end of Building 30206 as required to function within the 50 ft. minimum setback for the new Fire Station. Finally, the Southern limits of the building development (including fencing and delivery roads) shall be as far north as prudent design will allow. The Design Build Contractor, within the limits set forth, will determine specific building location and orientation. The proposed personal vehicle parking area is located East of the new fire station and West of Skeel Avenue. Its location shall comply with force protection standards and allow for the development of aircraft parking area "F" South of the fire station. A representative area for construction of the building (including tire storage, dumpster enclosure, mechanical yard, access roads and fencing) is indicated on the drawings for guidance ONLY. * Amendment #0001

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2.3.2 The building shall be located within the limits set forth to minimize the requirement for relocation of existing major utilities. Underground utilities within the building footprint shall be relocated.

2.3.3 Incorporate all applicable stand-off criteria (AT/FP, airfield operations, etc.) when locating the building.

2.4 BUILDING DEMOLITION REQUIREMENTS

2.4.1 Demolition of four buildings, 11405, 20090, 30201, 30206 (partial - fire station single vehicle bay only) shall be included in the scope of work. Refer to drawings for locations and information regarding the construction of the buildings.

2.4.2 Building 30201 is shown on the plans and is located as follows: It is east of Skeel Avenue and is bounded by Van Patton Drive to the north, Allbrook Drive to the south, Skeel Avenue to the west and Pearson Road to the east. The building is a single-story Administration/Office Building constructed of

concrete masonry unit walls with an exterior insulation finish system. The attic and roof structure are timber-framed trusses. The existing Building 30201 parking lot to the west shall remain. The Contractor shall repair any damage to the parking lot resulting from demolition activities. Access drives and walkways from the parking lot to adjacent streets shall be retained and repaired as necessary. Existing sidewalks/steps and handrail accessing Building 30201 doors shall be removed. Shrubs adjacent to the building shall also be removed. Repair edge of walkways, driveways and parking lot required as a result of removals. The building site shall be backfilled with engineered controlled earth fill and topsoil, finish graded and seeded.

2.4.3 Building 30206 (Airfield Operations) is located north of the new construction site along the airfield. Demolition includes the Fire Station Vehicle Bay (north side of the building) only. The Building is a single-story vehicle bay facility constructed of a 12" concrete masonry unit wall and a roof structure of metal bar joists and metal decking. The Fire Station Vehicle Bay is a building addition and is not of historic significance. The Contractor is responsible for repairs to the remaining Building 30206 structure, HVAC, plumbing and fire protection (sprinkler) systems resulting from demolition damage and remaining conditions that do not match the contiguous or adjacent structure. The final condition of the remaining building after demolition shall result in an appearance that reflects no visible evidence of the demolition; i.e. a finished appearance. The building floor shall be removed and replaced with concrete paving designed and constructed to support fire and maintenance vehicles. Floor drains and sanitary piping shall be removed and capped. Chain link fence shall be extended to secure the flight line and a new 30-ft wide automatic sliding gate installed. New sliding gate shall be operational before construction of the Main Fire Station Building commences. Building 30206 will be occupied during demolition. Provide any temporary measures necessary to maintain the operation of utilities and access to existing spaces remaining.

2.4.4 Building 11405 (Communications Maintenance Facility) located on the west side of Communications Boulevard adjacent to Gate 15A (Area C). The building is a single-story Building constructed of concrete masonry unit walls, sloped wood truss roof, and a flat hollow core concrete planked roof with a concrete leveling course. Site items to be removed include concrete sidewalk, patio, and shrubs. Portions of concrete and asphalt pavement to remain shall be saw cut. The building site shall be backfilled with engineered controlled earth fill and topsoil, finish graded and seeded.

2.4.5 Building 20090 (Oil Drum Storage) is located north of Woodland Hill in close proximity to Gate 19B. The building is a single-story open structure currently being used as a storage shelter. The structure consists of a steel framed roof structure with a 9' high fence below the perimeter of the roof. Site items to be removed include the gravel driveway, ditch box culvert and headwalls, and a corrugated metal pipe. The street ditch shall be restored with riprap to match existing. The building site shall be backfilled with engineered controlled earth fill and topsoil, finish graded and seeded.

2.4.6 Demolition for each building shall include the primary structure, foundations, paving and underground utilities serving the building. All existing building materials, slabs, footings, gravel parking base, paving materials, drainage structures, piping, vegetation, debris, and unsuitable surface soils shall be removed from the site and shall be properly disposed of at an appropriate "off-Base" location. Suitable topsoil shall be stockpiled for use in final grading. During stripping and rough grading, positive surface drainage shall be maintained to prevent the accumulation of water.

*** Amendment #0001**

All building demolition will be accomplished after the new Fire Station has been constructed and is occupied. Building 30206 (partial) will be the last structure demolished. *** Amendment #0001**

*** Amendment #0001**

2.4.7 For each building demolition, cap utilities a minimum of 24" below grade at the building and remove lateral back to the main including replacing the connection to the main with a straight section of pipe. Remove building electrical service feeder to nearest switch or disconnecting device. Remove steam and condensate lines to nearest manhole and provide return loop to insure the system continues to operate properly. Provide final "As-Built" drawings indicating the extent of removals and location of capped utilities. Maintain in service any utilities serving other facilities that are routed through the demolition site. *** Amendment #0001**

2.5 ENVIRONMENTAL CONSIDERATIONS

2.5.1 A complete environmental survey identifying the presence of hazardous materials for the Fire Station construction site and buildings to be demolished is not available. Asbestos containing materials (ACM) are known to exist in Buildings 30201 and 30206. Following are the building demolition Hazardous Materials requirements:

- Include an allowance of \$120,000 for removal, abatement and proper disposal of any hazardous materials found at the Fire Station construction site (including underground utilities) and in the existing structures to be demolished.
- The contractor shall complete a comprehensive hazardous materials environmental survey and report for each of the buildings to be demolished. The Report shall identify existing conditions, presence of any hazardous materials, recommendations for abatement and disposal and a detailed cost for the required abatement and disposal. A contract modification (deduct or add) will be executed against the \$120,000 contract allowance.
- The following hazardous materials may be encountered:
 - ☐ Asbestos Containing Materials (ACM)
 - ☐ Lead Containing Paint (LCP)
 - ☐ Mercury Containing Lamps (MCL)
 - ☐ Poly Chlorinated Biphenols (PCB)
 - ☐ Refrigerants
- Asbestos removal shall be in accordance with Section 02081 REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS.
- Lead Based Paint shall be handled in accordance with Section 02090 REMOVAL AND DISPOSAL OF LEAD PAINT CONTAINING MATERIAL
- Mercury Containing Lamp removal shall be in accordance with Section 02083D REMOVAL OF MERCURY CONTAINING LAMPS
- PCB removal shall be in accordance with specification section 02083C REMOVAL OF POLYCHLORINATED BIPHENYL FLUORESCENT LIGHT BALLASTS
- Refrigerants shall be recovered in accordance with specification section 02091 OZONE DEPLETING SUBSTANCE RECOVERY.
- The presence of asbestos Demolition crews will be responsible for adhering to applicable health and safety regulations.

2.5.2 It is assumed that steam piping in the vicinity of the New Fire Station construction site has asbestos insulation. Relocation of existing piping and tie-in for the building utility connection shall anticipate the removal and disposal of asbestos insulation.

2.5.3 It is anticipated that transite water pipe will not be encountered.

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2.6 SITE PREPARATION

2.6.1 Prior to commencing with Phase 1 work, a temporary construction chain link fence and water-filled jersey median barriers shall be installed to protect the flight line. This system will extend from the existing flight line fence Northeast of Building 30145 (minimum 65-ft North of Building 30145), Westward, to the West edge of existing Building 30145; then, extend northward to a point approximately 50-ft South of Building 30206; then, extend Eastward to meet the existing chain link flight line fence. Temporary chain link fence shall be 7-ft tall with 3 strands of barbed wire (total fence height=8-ft), with posts attached to the water-filled jersey barriers. Top and bottom rails are not required. Comply with the following specifications: ASTM F626, ASTM F669, ASTM F1083, Federal Specification RR-F-191/1, Type I, and ASTM A 392. A polypropylene safety fence shall also be installed around the perimeter of the construction area. All existing concrete apron paving, asphalt pavement, curbs, sidewalk, chain link fencing, utilities, drainage structures and piping, vegetation, trees, shrubs, and debris shall be removed from the construction area and ultimately removed from the Base. Suitable topsoil shall be stockpiled for use in final grading. Any required borrow material will need to be brought to the site from sources off of the Base. During stripping and rough grading, positive surface drainage shall be maintained to prevent the accumulation of storm water. The contractor shall coordinate staging and stockpile areas with the Contracting Officer.

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2.6.2 BID OPTION #3 - Phase 2 work consists of widening the asphalt concrete shoulders to fill in the apex between the aircraft parking apron and taxiway "B" as shown in the drawings. It shall be coordinated with the Contracting Officer for access and executing the work. Existing Taxiway "B" will be closed for portions of the construction period. Coordinate operation of Taxiway "B" with Airfield Management. Weekend or after hours work may be required. The site shall be stripped of all topsoil and vegetation. All existing asphalt paving, taxiway lights, conduit, drainage structures, and piping shall be removed. Suitable topsoil shall be stockpiled for use in final grading. Unsuitable material and debris shall be removed from the site. Any required borrow material will need to be brought to the site from sources off of the Base. The area shall be proof rolled prior to constructing the roadway. All soft areas shall be replaced with ODOT Item 304 aggregate base. Contractor shall comply with all provisions of the Geotechnical Report required as part of the design/build work. Storm drainage must be maintained during and after construction. Additional catch basins shall be provided as needed. Temporary taxiway lighting shall be provided as per Airfield Management. Existing taxiway lights that are removed shall be replaced with semi-flush mounted taxiway light fixtures to accommodate the pavement. It is anticipated that ten lights will need removal and replacement.

2.6.3 Sediment and erosion control measures shall be installed and maintained by the contractor for the duration of the construction. These measures and other best management practices shall be implemented prior to commencement of earthwork. The Contractor shall comply with all provisions of the *Ohio Rainwater and Land Development Manual* and Wright Patterson Air Force Base policies regarding runoff control. The Contractor shall comply with all requirements of the Ohio EPA. Specific erosion control measures include, but are not limited to, providing silt fences to filter sheet runoff, straw bales around inlets and temporary seeding as required. All permits are to be paid by the contractor. A copy of all permit application/correspondence shall be provided to the

Contracting Officer. Contractor shall prepare applications and pay permits for EPA NOI and NOT permits.

2.6.4 The Contractor shall prepare a Notice of Intent application with payment and submit to 88 ABW/EMO for review. 88 ABW/EMO will forward the application and payment to the Ohio EPA. The NOI must be approved by the Ohio EPA prior to any soil being disturbed. The Contractor shall comply with all erosion control requirements of the Ohio EPA. Specific erosion control measures include, but are not limited to, providing silt fences to filter sheet runoff, straw bales around inlets and temporary seeding as required.

2.6.5 Upon completion of the construction project, a Notice of Termination shall be submitted to the 88 ABW/EMY, Design Program Manager, for submission to the OEPA.

2.6.6 Protect the surrounding areas and repair any pavement or site feature that is disturbed or damaged during the project construction. All temporary facilities (i.e. fencing, etc.) shall be removed after construction.

2.6.7 Do not locate the new Building over existing utilities. Reroute existing utilities within the building footprint area.

2.6.8 Burning will not be permitted.

2.6.9 Blasting will not be permitted.

2.7 GRADING

2.7.1 Minimum filling operations are anticipated. Before any required filling operations begin, representative samples of the proposed fill material shall be tested to determine the maximum dry density, optimum moisture content, natural moisture content, gradation, and plasticity of the soil for quality control during grading compaction operations needed.

2.7.2 All compacted fill should be constructed by spreading satisfactory material in loose layers not more than 8-inch thick and compacting to densities established by the geotechnical engineer. It is anticipated that compaction under pavement and structures will be to 95% of the material's maximum dry density per ASTM D 1557 (modified proctor) at a moisture content within 2% of the optimum moisture content; Lawn areas will be compacted to 90% modified proctor.

2.7.3 Storm water from open excavations and trenches shall be monitored and not permitted to flow directly into natural watercourses.

2.7.4 Finish grade will be established a minimum 6-in below finish floor line (except at driveways and ADA accessible entrances) and graded to drain away from the building at 5% minimum slope.

2.7.5 The lawn area adjacent to the taxiway paved shoulders shall be graded as follows: 1-1/2" drop off the edge of pavement; then, 5% slope for the first 10-ft; beyond 10-ft, slope at 2% minimum, 4% maximum.

2.8 SITE ASPHALT PAVING, SIDEWALK & CONCRETE CURBS

*** Amendment #0001**

2.8.1 A new asphalt concrete (AC) or portland cement concrete (PCC) parking lot shall be installed on the west side of Skeel Avenue to maximize the number of

parking spaces on the west side of Skeel Avenue. Parking count shall be no less than 75 vehicles. Provide an AC or PCC driveway with loading zone and 10 additional parking spaces for mission essential vehicles adjacent to the new building. Delivery trucks shall be provided access to a loading/unloading area adjacent to the fire extinguisher storage area and Kitchen. Pavement strength and geometrics for this truck access shall accommodate an AASHTO WB50 design vehicle. * Amendment #0001

2.8.2 Asphalt pavement shall be provided as necessary to rework the driveway into Building 30206 across from Van Patton. Curbs shall be reworked in this area to ease access into the garage South of the building.

2.8.3 PCC pavement shall be provided for crash and structural fire fighting vehicles adjacent to the new building. PCC pavement shall be extended from the building to Skeel Avenue and shall be the full width of the Apparatus Room. On the flight line side, PCC pavement shall be installed from the building to the existing concrete apron for the entire building width. The concrete apron on the structural response side of the building shall be sufficient for any fire, crash or rescue vehicles to turn around and back into the Apparatus Room without blocking traffic on Skeel Avenue. Pavement designs shall be as per the Base Facility Standards and Unified Facilities Criteria (UFC) 3-260-02 to accommodate the design vehicle for 50 movements per bay per day. Maximum depth is 12-inches. Concrete pavement in areas not subjected to truck traffic may be designed for applicable (lighter) loadings. The design vehicle load is based on the TI-3000 with snozzle vehicle. Design the pavement to accommodate a vehicle turning circle of 160-ft. (diameter).

2.8.4 PCC pavement shall also be provided for the area uncovered as part of the partial Building 30206 demolition. Pavement design shall be for the TI-3000 snozzle vehicle with 50 movements/day.

2.8.5 Bid Option #3: Asphalt pavement shall be provided for the crash response access pavement. Pavement strength and geometrics for this pavement shall accommodate a TI-3000 with snozzle with a weight of 80,900 lbs. and a turning circle of 160-ft. (diameter). Pavement designs shall be as per the Base Facility Standards and Unified Facilities Criteria (UFC) 3-260-02. Approximate extent of paving is shown on the plans. Sawcut and remove a portion of existing asphalt shoulders to provide a vertical surface for abutting new asphalt pavement with existing. Slope pavement as per UFC 3-260-01 at a maximum slope of 2.0% towards the grass infield.

2.8.6 Concrete sidewalks shall be provided from the parking areas to the building. Handicap accessible ramps shall be provided per ADA requirements. Concrete sidewalk shall be 4-ft wide, minimum.

2.8.7 Parking areas shall be laid out with typical vehicle spaces measuring 9-ft X 18-ft. Aisles shall be 25-ft wide for 2-way traffic. Handicap accessible parking spaces shall be provided per ADA requirements.

2.8.8 All materials for the paving, sidewalk and curbs shall be in accordance with the latest edition of the Ohio Department of Transportation Construction and Materials Specifications or in accordance with the Base Facility Standard, whichever is more stringent. Design pavements for a 20-yr lifespan.

2.8.9 Parking lots shall be designed for a 20-year life span for light-duty automobile traffic.

2.8.10 Specifications and Materials

- ☐ Plain Concrete Pavement - ODOT Item 452 with Class C concrete per ODOT Item 499. Provide minimum 28-day compressive strength of 4,000 psi. Provide 28-day flexural strength of 650 psi.
- ☐ Asphalt Concrete Surface Course - ODOT Item 448, Type 1 with PG 64-22 Binder
- ☐ Asphalt Concrete Intermediate Course - ODOT Item 448, Type 1 with PG 64-22 Binder
- ☐ Asphalt Concrete Base Course - ODOT Item 301 with PG 64-22 Binder
- ☐ Aggregate Base - ODOT Item 304
- ☐ Tack Coat - ODOT Item 407 (.075 gal/SY)
- ☐ Prime Coat - ODOT Item 408 (0.40 gal/SY)
- ☐ Concrete Sidewalk - ODOT Item 608, plain concrete, 4-inches thick; tooled joints at 4-ft spacing
- ☐ Concrete Curb - ODOT Item 609, 6-in x 24-in per base standards
- ☐ Concrete Curb & Gutter - ODOT Item 609 & ODOT Std. Dwg BP 5.1, Type 2 (or match existing).
- ☐ 1" chock course drainage layer of #9/#11 stone is required for all concrete and asphalt pavement

2.8.11 Typically PCC pavement shall be designed as non-reinforced pavement. Joints shall be spaced at a maximum of 15-ft unless engineering calculations indicate otherwise. In areas where odd shaped slabs occur (e.g. the length of slab exceeds width of slab by more than 25%), welded wire fabric, ASTM A185, shall be added to offset temperature related stresses.

2.8.12 PCC joints shall be designed to accommodate edge stresses built up as vehicles approach the joint. This is normally accomplished by thickening the edges for expansion joints. Provide expansion joints where slabs abut light pads, catch basins, manholes, footings, and structures.

2.8.13 Provide doweled precast concrete wheel stops for vehicle parking where curbs are not utilized. Wheel stops shall be located 30-inches from the edge of pavement.

2.8.14 Guard posts (bollards) shall be 36-inches tall, 4-inch diameter steel pipe filled with concrete and embedded in a Portland cement concrete foundation. Guard posts shall be painted per base standards. Provide a Guard Post on either side of each Apparatus room door (inside and outside of doors), at structural elements, and the standpipe within the apparatus bays.

2.8.15 Striping operations shall also be included in the work as per Ohio Department of Transportation Construction and Materials Specifications. Glass beads for reflective markings shall conform to Federal Specification FS TT-B-1325, Type III; Gradation A. Parking lots will be striped with 4" wide, white paint. Twenty-four inch stop bars will be painted on Skeel Avenue below the flashing lights. These will be offset from the driveway and overhead lights to provide appropriate sight distances. Finally, double-yellow road markings will be extended on the North side of Building 30206 to the proposed 30-ft wide sliding airfield access gate.

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2.8.16 NOT USED.

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2.8.17 Street curb and gutter shall be restored at all curb cuts for new driveways. Existing curb inlets located in curb cuts shall be relocated upstream of curb cuts.

2.9 STORM DRAINAGE

2.9.1 Surface drainage for the site shall be directed away from the new building at a minimum 5% slope. Provide minimum slopes of 0.4% for concrete paved areas and 1.0% for asphalt pavement and unpaved areas.

2.9.2 Roof drainage shall be tied into the site storm system by minimum 8-inch PVC storm drains. Storm drainage tie-in locations are available within the immediate proximity of the site. Refer to existing site survey drawings for utilities locations. Yard cleanouts shall be provided 5-ft outside building for all interior downspouts, at all pipe junctions, and at 100-ft maximum spacing.

2.9.3 Design and sizing of storm sewer system shall be based upon the Rational Method using a 25-year storm frequency. Sizing of pipes and structures will need to include upstream flows, if applicable, and be designed to provide gravity flow conveyance of the design storm. Manning's formula shall be utilized to select pipes based on full capacity gravity flow. The minimum size of storm sewers between storm structures shall be 12-inches in diameter. Match crown elevations where smaller pipes join larger pipes.

2.9.4 Minimum pipe cover shall be 24-inches for typical traffic loadings. Cover shall be measured from the top of the pipe to the bottom of rigid pavement and to the top of flexible pavement or finished grade. The strength of the pipe and bedding design shall be specified to accommodate heavy fire, rescue and crash response vehicles specified in Section 2.8, where appropriate.

2.9.5 Offset storm drainage pipes paralleling building foundations at least 10-ft from the building foundation. Lay storm pipe in its own trench. Provide catch basins, inlets, or manholes at pipe junctions and where there is a change in either horizontal or vertical alignment. Provide manholes/inlets at least every 400-ft.

2.9.6 Swales and sheet flow surface drainage is preferred over underground conduit systems where land use permits. Overland flow values, rainfall data, etc. shall be computed in accordance with local regulatory requirements.

2.9.7 New storm sewer shall be furnished and installed in trenches 16-inches wider than the each pipe's outside diameter. Trench side slopes shall be sloped per EM385-1-1 requirements from a point 12-inches above the pipe to grade. Bedding shall be a minimum 4-inches below the pipe and minimum 12-inches over the pipe. Bedding shall be a clean, well-graded, sand and gravel with maximum particle size of ¾-inch. Backfill may be acceptable insitu material in lawn areas; granular material under pavement. Provide backfill compaction per paragraph 2.7.2. Existing pavement to remain shall be saw cut 12-inches on each side of the trench excavation, removed and replaced with pavement of like material and strength. The minimum velocity in the storm sewer pipe shall be 2.5 ft/sec.

2.9.8 Specifications and Materials

- ❑ Storm Sewer Pipe - Reinforced Concrete Circular Pipe, ASTM C 76 & ASTM C 665, Class III or greater strength, with resilient and flexible gasket joints ASTM C 443 in accordance with ODOT 706.02 and 706.11. Furnish and install as per ODOT Item 603.
- ❑ Roof drain Pipe - SDR 35 PVC with flexible elastomeric seals as per ASTM D 3034 except where pipes cross under vehicular pavements with

less than 24-inches of cover. In this case, provide ductile iron pipe (ASTM A-746).

- ❑ Manholes - Furnish & Install per ODOT Item 604. Precast concrete ASTM C 478, eccentric cone top, flexible gasket joints per ASTM C 443, ductile iron castings per ASTM A 536.
- ❑ Catch Basins - Pre-cast or cast-in-place concrete, minimum 3000 psi @ 28 days compressive strength, ODOT 499, Class C. Ductile iron castings per ASTM C 536, Class 60-40-18 (Heavy-duty). Furnish & install per ODOT Item 604.
- ❑ Cleanouts - Cast iron pipe, frame & grate.
- ❑ Underground Plastic Line Markers for roof drains/leaders only.

2.9.9 Storm water detention is not required.

2.9.10 Adjust manholes/inlets to grade as required.

2.9.11 The contractor shall provide storm sewer routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the building. Storm sewers are immediately available along Skeel Avenue. Provide new manholes/inlets as required.

2.9.12 Existing storm sewers may need to be relocated (depending on the building location) because of the new building construction; sewers are not permitted underneath buildings.

2.10 SANITARY SEWER

2.10.1 Domestic sewerage for the new construction will be routed to the existing sanitary sewer system. Sewer services shall be designed in accordance with the International Plumbing Code for peak flow conditions. All laterals shall be a minimum of 6-inch PVC pipe. Cleanouts shall be spaced every 75-ft, at junctions and at bends.

2.10.2 Domestic sewerage tie-in locations are available within the immediate proximity of the site. Refer to existing site survey drawings for utility locations.

2.10.3 The strength of the pipe and bedding design shall be specified to accommodate heavy fire, rescue and crash response vehicles specified in Section 2.8, where appropriate.

2.10.4 Existing sanitary sewers may need to be relocated (depending on the building location) because of the new building construction; sewers are not permitted underneath buildings. Relocated sewers shall be designed in accordance with Wright Patterson Air Force Base Facility Standard and Ten-State Standards. Manholes shall be provided at the end of each line; at all changes in grade, size and alignment; at all intersections; and at distances not greater than 400-ft. Minimum size shall be 8-inches; minimum cover 3-ft. Cover shall be measured from the top of the pipe to the bottom of rigid pavement and to the top of flexible pavement or finished grade. The strength of the pipe and bedding design shall be specified to accommodate heavy fire, rescue and crash response vehicles specified in Section 2.8, where appropriate.

2.10.5 New sewer mains require EPA approval. A Permit to Install application and payment shall be submitted to 88 ABW/EMO for review. 88 ABW/EMO will forward the application and payment to the Ohio EPA. The PTI must be approved prior to any soil being disturbed. Contractor is required to prepare all application

materials and pay all fees associated with EPA's approval. Questions should be directed to Martin Nicodemus at 88 ABW/EMY (937-257-5536 ext. 230).

2.10.6 Design gravity sewers to maintain a minimum mean velocity of 2.5-ft/s. Sewer lines shall be laid with straight alignments and uniform slopes between manholes. Curvilinear alignments of sewer lines are not acceptable. Alignment shall be checked with a laser beam.

2.10.7 Existing sewer service shall be maintained at all times. Pipes between manholes shall be air tested and manholes vacuum tested per requirements of Wright Patterson Air Force Base Facility Standard and Ten-State Standards, latest edition. In addition, all PVC pipe shall be tested for deflection in accordance with Ten-State standards requirements. Sewer laterals shall be tested in accordance with provisions in the International Plumbing Code.

2.10.8 Specifications and Materials

- ☐ Sanitary Sewer Pipe - SDR 35 (minimum - use higher strength where required) Polyvinyl Chloride (PVC) pipe conforming to ASTM D1784 with a cell classification of 12454-B. Joints shall be gasketed per ASTM D3034. Furnish and install pipe as per ODOT Item 603. Slope sewer services at 2.0% if possible (1.0% minimum).
- ☐ Manholes - Furnish & Install per ODOT Item 604. Precast concrete ASTM C 478, eccentric cone top, flexible gasket joints per ASTM C 443, ductile iron vented castings per ASTM A 536. Rim Elevation shall be set at least 150mm above surrounding grade in yard locations and is situated so storm drainage is not collected in pavement areas.
- ☐ Cleanouts - Cast iron pipe, frame & grate.
- ☐ Underground Plastic Line Markers for sewer service lines only.

2.10.9 New sanitary sewer shall be furnished and installed in trenches 16-inches wider than the each pipe's outside diameter. Trench side slopes shall be sloped per EM385-1-1 requirements from a point 12-inches above the pipe to grade. Bedding shall be a minimum 4-inches below the pipe and minimum 12-inches over the pipe. Bedding shall be a clean, well-graded, sand and gravel with maximum particle size of ¾-inch. Backfill may be acceptable insitu material in lawn areas; granular material under pavement. Provide backfill compaction per paragraph 2.7.2. Existing pavement to remain shall be saw cut 12-inches on each side of the trench excavation, removed and replaced with pavement of like material and strength.

2.10.10 Contractor shall adjust existing manhole structures to grade as required.

2.10.11 The contractor shall provide sanitary sewer routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the building. Provide new manholes as required.

2.11 WATER DISTRIBUTION

2.11.1 Contractor shall coordinate (in advance) taps into the existing water mains with the Contracting Officer. Before fire sprinkler system is designed, a flow test shall be performed to verify the available flow and pressure for the existing 6-inch water main along Skeel Avenue. This line shall be tapped for fire and domestic water services, if adequate. If flow conditions in this main are inadequate for sprinklers, the adjacent 14-inch hanger fire protection water

main may be tapped for firewater service. A minimum 6-inch fire service line shall be provided to serve the building's sprinkler system. This line shall be wet-tapped using a tapping valve and sleeve. Fire service design will be in accordance with NFPA 24. New domestic water service shall be routed to the building parallel to the fire service. The domestic water service will be wet-tapped off the existing 6-inch water main along Skeel Avenue. Water lines shall be sized by the design/Build Contractor per the International Plumbing Code based on fixture units. Waterline installation shall be in accordance with AWWA C600.

2.11.2 New water service shall be furnished, installed, tested and disinfected in accordance with the International Plumbing Code. Watermains shall be tested and disinfected as per AWWA C651, AWWA C652, AWWA C653, and AWWA C654.

2.11.3 A post indicator valve shall be placed on the fire water service before entering the building.

2.11.4 Existing 14-inch fire and 6-inch water lines may need to be relocated (depending on the building location) because of the new building construction; waterlines are not permitted underneath buildings. Relocated waterlines shall be designed in accordance with Wright-Patterson Air Force Base Facility Standard and Ten-State Standards. Size shall match existing; minimum depth shall be 4-feet.

2.11.5 New water mains require EPA approval. A Permit to Install application and payment shall be submitted to 88 ABW/EMO for review. 88 ABW/EMO will forward the application and payment to the Ohio EPA. The PTI must be approved prior to any soil being disturbed. Contractor is required to pay all fees associated with EPA's approval.

2.11.6 Specifications and Materials

- ❑ Site Water Pipe 4-inch and larger - Class 350 Ductile Iron Pipe with push-on joints as per ANSI/AWWA C-151/A21.51 and ANSI/AWWA C-111/A21.11 or C-900 PVC with a pressure rating twice the water main's static pressure. Fittings and valves to be mechanical joint ductile iron as per ANSI/AWWA C-110/A21.10 and ANSI/AWWA C-111/A21.11. Provide cement mortar lining for ductile iron pipe and fittings as per AWWA C104. Provide polyethylene encasement for ductile iron pipe as per AWWA C105. 2-inch and 3-inch pipe shall be PVC conforming to ASTM D2241, elastomeric joint, with appropriate pressure rating. Pipe smaller than 2-inches shall be Type K copper. Provide adequate thrust restraint for all piping, fittings, and valves. 2.10.3 The strength of the pipe and bedding design shall be specified to accommodate heavy fire, rescue and crash response vehicles specified in Section 2.8, where appropriate.
- ❑ Install pipe with 4-ft minimum cover. Locate fire hydrants or other forms of air release at high points.
- ❑ Valves 3-inch and larger shall be iron body resilient seated gate valves rated at 200 psi working pressure as per AWWA C509. Tapping sleeves shall be designed for pipe being tapped. Tapping valve shall match the gate valve standards. Valves shall be the same diameter as the mains to which they are installed.
- ❑ Valve boxes shall be adjustable cast iron 5-1/4-inch shaft boxes.
- ❑ Fire Hydrants shall be dry barrel type rated at 200 psi and comply with requirements of ANSI/AWWA C502 with extensions as required. Fire hydrants shall also be furnished and installed in accordance with Wright Patterson Air Force Base Standards. Hydrants shall be located 5 to 6-ft off of pavement and be located at 500-ft maximum spacing.

Hydrants shall be located such that all portions of the building shall be reachable by hose lays of not more than 300-ft. Provide bollard protection for hydrants subject to vehicle damage.

- ❑ Underground Plastic Line Markers.
- ❑ Corporation and curb stops (less than 3-inch diameter) shall be constructed of 85-5-5-5 brass per ASTM B62 and shall be in accordance with AWWA C800. Provide a curb stop on the domestic water service 3m outside of the new building.
- ❑ Post Indicator Valve shall be cast iron with variable length extension rod. Provide protection when subject to vehicle damage.
- ❑ Fire Department Connection shall be 4-inch Stortz style with 30-degree turn down and be in accordance with NFPA 24. It shall be 30-36-inch high and be located no further than 150-ft from the nearest fire hydrant. Provide bollard protection when subject to vehicle damage.
- ❑ Meter/meter boxes will not be required in accordance with Wright-Patterson Air Force Base Standards.

2.11.7 New water main shall be furnished and installed in trenches 16-inches wider than the each pipe's outside diameter. Trenches shall be sloped per EM 385-1-1 requirements from a point 12-inches above the pipe to grade. Bedding shall be a minimum 4-inches below the pipe and minimum 12-inches over the pipe. Bedding shall be a clean, well-graded, sand and gravel with maximum particle size of ¾-inch. Backfill may be acceptable insitu material in lawn areas; granular material under pavement. Provide backfill compaction per paragraph 2.7.2. Existing pavement to remain shall be saw cut 12-inches on each side of the trench excavation, removed and replaced with pavement of like material and strength.

2.11.8 Existing water valve chambers and boxes, fire hydrants and appurtenances shall be adjusted to grade as required by the proposed work.

2.11.9 Provide a fire department connection for sprinklers. A fire hydrant shall be located within 150-ft of the connection.

2.11.10 Existing fire hydrants shall be relocated and/or replaced as required by the proposed development. Contracting officer shall determine if existing fire hydrants may be reused. Specification, location and orientation shall be approved by Wright-Patterson Air Force Base.

2.11.11 The contractor shall provide water main and service routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the building. Fire and domestic mains are immediately available along Skeel Avenue. Provide new valves on each branch of Tee-junctions and as required.

2.12 GAS DISTRIBUTION

2.12.1 Gas service for the fire station building is available in the vicinity of Pearson Road and Allbrook.

2.12.2 Specifications and Materials

- ❑ Site Gas Pipe - Polyethylene Plastic pipe that meets the requirements of ASTM Specifications, D2513 and PE 2406. The strength of the pipe and bedding design shall be specified to accommodate heavy fire, rescue and crash response vehicles specified in Section 2.8, where appropriate. Joints shall be butt fusion. Tracer wire must be taped to the meter end and extended to the street end of the plastic pipe. Tracer wire shall be solid insulated copper wire, #12 gage or heavier.

- ❑ Gas service trench shall be at least 3-ft away from other utility trenches. Twelve-inch minimum separation shall be provided at all utility crossings. Polyethylene plastic pipe cannot be installed within 5-ft of an underground steam line.
- ❑ Minimum pipe cover is 18-inches for conduits 2-inch and smaller; 30-inches cover required for conduits 3-inch and larger.
- ❑ Conform to ASME B31.8 (2000) Gas Transmission and Distribution Piping.

2.12.3 The Contractor shall provide gas main and service routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the buildings. An existing 3" gas main with 10-PSI pressure is immediately available along Pearson Road. Provide new valves as required by gas utility.

2.13 STEAM SUPPLY AND CONDENSATE RETURN LINES (HPS, CPR)

2.13.1 Steam (HPS) service for the building will be routed from an existing HPS (70 psi) pit on Skeel Avenue, just South of the Building site. Route new HPS supply and condensate return lines in a concrete shallow trench system to the main mechanical room. Contractor shall coordinate, in advance, the tap into the existing mains with the Contracting Officer. HPS is not available during the non-heating season 1 May through 1 October.

2.13.2 Assume 400 feet of existing direct-buried (Ricwil type) 10-inch HPS and 2.5-inch HPR lines will need to be relocated (in shallow concrete trench) because of the new building construction; steam lines are not permitted underneath buildings. Relocated steam lines shall be designed in accordance with Wright Patterson Air Force Base Standards and good engineering practice. Size shall match existing.

2.13.3 Specifications and Materials

2.13.3.1 New exterior piping systems shall consist of the following:

- ❑ Steel service pipe shall be heavy weight (Schedule 80) ASTM A53 Grade B, electric resistance welded carbon steel. All joints shall be butt-welded, except joints 2-inches and smaller may be socket welded.
- ❑ All fittings and accessories shall be designed and factory fabricated to prevent moisture from entering into the system. Elbow insulation jackets shall be molded HDPE. The insulation jackets shall be extrusion welded or butt fusion welded HDPE. Gluing, taping or hot air welding of the insulation jacket shall not be allowed.
- ❑ All steam and condensate piping expansion compensation shall be accomplished via mechanical loops only.

* Amendment #0001

- ❑ Insulation for all piping, fittings and valves shall be cellular glass insulation conforming to ASTM C552. Insulation shall be factory or field applied.
- ❑ The outer protective insulation jacket shall be aluminum smooth sheet, 0.016 in. nominal thickness, ASTM B209M, ASTM B209, Type 3003, 3105 or 5005, or non-metallic jacket consisting of 203 grams per square meter (6 oz. per sq yard) fiberglass fabric impregnated with chlorosulfanated polyethylene (Hypalon) and a 0.038 mils polyvinyl fluoride film (Tedlar) bonded to it. Overall thickness of the composite shall be 0.010 in. and weigh approximately 10.5 oz. per sq. yard. Aluminum jacket shall be used over calcium silicate

insulation. Non-metallic jacket shall be used with molded mineral fiber insulation.

- ❑ Provide isolation valves on steam supply and condensate return lines at branch for service to building. Valves shall be located in valve boxes.
- ❑ Backfill and overall installation shall meet the requirements of the piping system manufacturer. The piping installation shall be approved and certified in the field by a representative of the piping system manufacturer.
- ❑ Hydrostatically test piping per ANSI B31.1 prior to burying.
- ❑ Provide factory-trained field technical assistance for material unloading, field joint installation instruction, piping installation and testing.

2.13.4 All steam system components, materials selection and sizing shall be made to allow for the future transition/switchover to central plant high temperature hot water.

2.13.5 The Contractor shall provide utility routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the buildings. Utilities are immediately available along Skeel Avenue. Provide new manholes as required.

2.14 VACUUM RETURN LINES (VR)

2.14.1 Existing 4-inch VR may need to be relocated because of the new building construction; vacuum return lines are not permitted underneath buildings. Relocated vacuum return lines shall be designed in accordance with Wright Patterson Air Force Base Standards and good engineering practice. Size shall match existing; minimum depth shall match existing.

2.14.2 See 2.13.3 for pipe specification.

2.14.3 The contractor shall provide utility routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the building. Utilities are immediately available along Skeel Avenue. Provide new manholes as required.

2.15 CONDENSATE PRESSURE RETURN (CPR)

2.15.1 Existing 5-inch CPR may need to be relocated because of the new building construction; condensate lines are not permitted underneath buildings. Relocated condensate lines shall be designed in accordance with Wright Patterson Air Force Base Standards and good engineering practice. Size shall match existing; minimum depth shall match existing.

2.15.2 See 2.13.3 for pipe specification.

2.15.3 The contractor shall provide utility routings and tie-ins for the new Fire Station at the appropriate locations based upon building location, orientation, and utilities located within the building. Utilities are immediately available along Skeel Avenue. Provide new manholes as required.

2.16 ELECTRICAL SERVICE

2.16.1 Building electrical service will be provided from the 12470-volt medium voltage underground service line located along Skeel Avenue (see drawings). Provide a new 12470: 480Y/277V pad mounted service transformer for the

Fire/Crash Rescue Station. Provide 15kV service to pad mounted transformer as described herein. D/B Contractor shall provide a sectionalizing switch after the manhole and prior to the transformer.

2.16.2 The D/B Contractor shall provide the electrical tie-in for the new Fire Station at the appropriate location based upon building location, orientation and utilities locations within the building. Utilities are immediately available along Skeel Avenue. Provide new manholes as required.

2.16.3 New underground electric shall be furnished and installed in trenches 16" wider than the each conduit's outside diameter. Trenches shall be sloped per EM 385-1-1 requirements from a point 12" above the pipe to grade. Backfill may be acceptable material in lawn areas; granular material under pavement. Existing asphalt (in streets to remain) shall be saw cut 12" on each side of the trench excavation, removed and replaced with heavy-duty pavement. The trench shall have excavation warning tape installed 1'-0" above the conduits. Contractor shall coordinate in advance the tap into the existing underground 12470-volt service with the Contracting Officer.

2.16.4 Provide a Diesel Generator Set for emergency back-up power. Generator shall serve the following:

- Alarm Communications Center (lighting (also provided with emergency ballasts), power, HVAC & communications)
- Overhead Apparatus Room vehicle doors
- Corridor lighting from living quarters to the Apparatus Room
- Building security system
- Closed Circuit TV system
- Life Safety Systems, including but not limited to, the fire alarm system and emergency Lighting
- Refrigerators and freezers
- All communication closets/rooms power
- Kitchen equipment

2.16.4.1 The system shall provide a minimum of three (3) day back-up power capacity with above ground tank. Generator shall be located near the Mechanical/Electrical courtyard within a weather-protected enclosure. The Automatic Transfer Switch shall be located in the Electrical Room.

2.16.4.2 Generator shall be provided with quiet pack (sound package) and be located so that it is accessible from the paved surfaces for access by maintenance and refueling vehicles. The generator shall also be provided with alarms for spillage monitored via phone lines to EMS.

2.16.4.3 BID OPTION #1 - In lieu of the emergency loads to be served as identified in paragraph 2.16.4, size the Generator to serve the entire building electrical load. All other requirements apply.

2.17 CATV

2.17.1 Cable TV shall be provided for the Facility. D/B contractor shall route coaxial cable in conduit from CATV connection point in building 206 (approx. 600') to new communication room in Fire Station. Contractor shall coordinate final connections with KAS Cable Company.

2.17.2 Trench shall have excavation warning tape installed 1'-0" above the conduits. Contractor shall coordinate in advance any tap in existing communications manholes with the Contracting Officer.

2.18 COMMUNICATIONS

* Amendment #0001

2.18.1 Refer to the site drawings for location of manholes. * Amendment #0001

2.18.2 Set a new manhole between MH FAA02 and MH FAA01. For reference purposes this manhole will be called MH FAA01B. Set this manhole (FAA01B) approx. 10 feet from FAA02. FAA01B needs to be 8' long x 4' wide x 6' deep. MH FAA01B needs two (2) new 4" concrete encased underground conduits from this manhole to the new communications closet in the new Fire Station. Also, MH FAA02 will need one (1) new 4" concrete encased underground conduit going from this manhole to the new communications closet in the new Fire Station.

2.18.3 Route new 12-strand single mode communications fiber in existing 4" underground conduit from manhole #355A to manhole FAA02. Extend fiber through 4" underground conduit from manhole FAA02 into the new Fire Station main communications closet.

2.18.4 Route new 12-strand single mode communications fiber in existing 4" underground conduit from manhole FAA01 to manhole FAA01B. Extend fiber through 4" underground conduit from manhole FAA01B into the new Fire Station main communications closet.

2.18.5 Route 1-600 pair of 4406 cable in existing 4" underground conduit from manhole #364 to MH #363A to FAA01 to FAA01B. Extend 4406 cable through 4" underground conduit to the new Fire Station main communications closet. NOTE: Fiber and copper must be placed in separate 4" conduits.

2.18.6 D/B Contractor shall test existing fiber cables in manholes prior to pulling to communications closet. Terminate fiber on 36 port FODP (Fiber Optics Data Port). Fiber caber shall be tested again after termination.

2.19 FENCING

* Amendment #0001

2.19.1 Permanent chain link fence shall be furnished and installed to secure the flight line. Fence shall tie in at the south end of the new Fire Station at a location that will allow access from the Skeel Avenue side for deliveries at the south end of the building and terminate at the existing fence to maintain a continuous barrier between Building 30145 and the new Fire Station. On the north side of the new fire station, flight line fence shall extend to Building 30206. Existing flight line fence and gate shall remain in this location. Modify gate as required to continue automatic function. New fence shall incorporate two continuous horizontal steel cables as a vehicle crash barrier. Direct access from the Apparatus Room driveway to Skeel Avenue is required; i.e. do not provide a fence and gate between the Apparatus Room and Skeel Avenue. *Amendment #001

2.19.2 Remove the existing vehicle gate and sufficient number of sections of the existing chain link fence that abut the north side of Building 30206 to facilitate the partial Building 30206 demolition. A new 30-ft wide automatic sliding gate shall be installed in this location. Gate shall be furnished and installed to be automatic with electric motors. Install and connect two Government furnished cameras, outdoor telephone, intercom, and electronic card

reader. Electric and control wiring for new gate shall be routed from existing controller in Building 30206, near control tower approximately 900' from proposed gate location. Contractor shall install and make all connections to Government furnished equipment. After completion of the demolition, replace the chain link fence with new fencing.

2.19.3 Replace chain link fence corner that was removed on Northwest side of steam pit that is Northeast of Building 30145.

2.19.4 Permanent chain link fence shall be 8-ft tall with 3 strands of barbed wire. Comply with the following specifications for galvanized fence materials: ASTM F626, ASTM F669, ASTM F1083, Federal Specification RR-F-191/1, Type I, and ASTM A 392. Utilize single arm steel barbed wire support arms (outriggers). Provide heavy-duty fence, accessories, posts, rails, bracing, tension wires, stretcher bars, etc. to match existing fence. Provide adequate grounding. Provide concrete foundations for posts.

2.19.5 Horizontal steel cable fence reinforcing shall be 3/4" aircraft cable as per Mil-Std. MIL-W-83420. Cable shall be installed at heights of 30-inches and 35-inches above ground level. Concrete deadmen shall be installed at 1,000-ft maximum spacing and at fence corners to anchor the cable. Deadmen shall be as per Mil Hdbk. 1013/10.

2.19.6 New gates shall incorporate horizontal steel cable reinforcing to match fencing and shall provide the same strength of construction in the closed position as the new fencing.

2.19.7 Refer to Section 2.6 for temporary construction fence requirements

2.20 SIGNAGE AND TRAFFIC SIGNALS

***Amendment #001**

2.20.1 Provide traffic signals, Regulatory and Warning signs in accordance with the Manual of Uniform Traffic Control Devices, latest edition. **Provide restricted area warning signs, FOD signs and stop signs at the new gate.**

***Amendment #001**

2.20.2 Traffic signaling will be required at Skeel Avenue for the structural response truck access apron. Traffic signal poles shall be located on the East and West sides of Skeel Avenue with 2 (3-way) 12" LED one-section signal heads supported in between. Push-button actuation shall be provided from inside the Fire Building. Furnish and install traffic signal in accordance with ODOT Standard Drawings and Specifications. Provide Type 170 or NEMA pole mounted controller with conflict monitors. Strain poles shall be steel with foundation. Provide flashing red operation for 40 seconds when actuated.

2.21 LANDSCAPING

2.21.1 Site & soil preparation, finish grading, placement of topsoil, seeding, and watering are to be included in the basic site requirements independent from the landscape/plantings requirements.

2.21.2 Seed shall be a fescue seed mix. All disturbed areas shall be seeded.

2.21.3 A soil test shall be performed on all topsoil for PH. Soil amendments and fertilizer application shall be determined from the soil test. Topsoil shall be placed to a depth of 6-inches from stockpile and/or offsite source as required.

2.21.4 Routine maintenance of all seeded areas is required during the establishment period of 12 months including eradicating weeds, insects and diseases, protecting ditches, etc. from surface erosion, watering, mowing, and post-fertilization.

2.21.5 Plantings and landscape design is not required for this project.

2.22 DUMPSTER ENCLOSURE

2.22.1 New (8-inch thick minimum) concrete dumpster pad, concrete access drive and enclosure shall be provided. The enclosure shall be suitable for two 8-CY dumpsters. A minimum 4-inch granular base shall be provided for the dumpster pad/apron area.

2.22.2 Dumpster enclosure wall construction shall match the new Fire Station Building's character. Provide screen wall on three sides with an open front for truck access. Screen wall shall extend 12-inches above the maximum height of the dumpster with its top lid in the open position.

2.22.3 Locate and construct the dumpster enclosure to comply with force protection requirements.

2.23 MECHANICAL / ELECTRICAL EQUIPMENT YARD

2.23.1 The mechanical/electrical equipment yard shall be fully enclosed with walls to match the new Fire Station Building's character and have an access gate. The yard shall house the emergency generator, diesel fuel tank, and electrical transformer, chiller and any other outdoor building mechanical or electrical equipment.

2.23.2 A minimum of 4-ft clearance shall be provided between the equipment and the inside face of the screen wall construction. Comply with Base Facility Standards. Screen wall shall be constructed to the same height as the top of the tallest piece of equipment.

2.23.3 Access opening in the mechanical screen wall shall be by way of ornamental gates. Gates shall be jamb mounted within the opening with hinges mounted to imbed plates. One leaf of the double-gate opening shall be provided with a door lever and locking mechanism designed for all weather conditions. The second leaf is to be provided with a flush bolt extended down into a concrete encased strike. Gate material shall be aluminum or stainless steel for minimum maintenance. Locks shall be keyed to Base standard "BEST" system.

2.24 OUTDOOR TIRE/EXTINGUISHER STORAGE

2.24.1 The Outdoor Tire/Extinguisher Storage Enclosure shall be fully enclosed with walls to match the new Fire Station Building's character and have an access gate. The Opening in the outdoor storage area shall be by way of ornamental gates wide enough for forklift and palettes to be moved in and out. Gates shall be jamb mounted within the opening with hinges mounted to imbed plates. One leaf of the double-gate opening shall be provided with a door lever and locking mechanism designed for all weather conditions. The second leaf is to be provided with a flush bolt extended down into a concrete encased strike. Gate material shall be aluminum or stainless steel for minimum maintenance. Locks shall be keyed to Base standard "BEST" The storage enclosure shall not be located on the flight line side of the building. This enclosure should be in character with the Fire Station Building. This area will also be required to be partially covered.

The cover should also be in character with the Fire Station and able to withstand year round weather conditions.

2.25 OUTDOOR PATIO/DINING AREA

2.25.1 Provide a 100 square foot covered patio area. Use materials for construction of the patio cover that are compatible with the building design and construction.

PART 3 - GENERAL CONSTRUCTION REQUIREMENTS

3.3 BUILDING ENCLOSURE

3.3.1 Exterior Wall Construction and Architectural Character

3.3.1.1 The new Fire Station will consolidate the existing Main Fire Station (Building 30163) and the Flight Line Fire Station (Bldg 30206) into a single story state-of-the-art facility. The new building will provide crash response for the airfield and structural response capability for Areas A, C and Kittyhawk of the Base. In addition to fire response capability the Fire Station will include a Central Alarm Communications Center for both fire and security forces at Wright-Patterson AFB.

3.3.1.2 The architecture of this new consolidated Main Fire Station with a Central Alarm Communications Center is important. Creativity in design to provide an appropriate architecturally compatible facility is required. This new building will be located between Buildings 30206 and 30145. The world-renowned architect Albert Kahn designed building 30206. The balance of the adjacent flight line neighborhood includes several other traditional hangar facilities in addition to Building 30145.

3.3.1.3 The new Fire Station will be a single story structure designed and constructed with an architectural character reflecting the "industrial" nature of the flight line and flight line activity. The residential nature of Fire Station exterior architecture reflected in the Fire Station Design Guide is not representative of the requirement for this project. Building 30206, although significantly different in scale, is the predominant structure along the flight line. While the new Fire Station needs to be architecturally compatible with Building 206, it must also take into consideration visual cues in terms of massing from the more traditional hangar facilities along the Skeel Ave side of the flight line. Photographs of Buildings 30206, 30145 and the adjacent existing flight line neighborhood are included for reference.

3.3.1.4 Exterior architecture will be in compliance with the Base Facility Standard. The building roof will be standing seam metal. Appropriate exterior wall construction materials to be considered include precast concrete, concrete, metal panel, and limited use of brick.

* Amendment #0001

3.3.1.5 Brick veneer (if used) shall be similar in size and color of the brick on the existing significant buildings south along the flight line. The use of "red" brick found on the buildings in Area C of the Base is not appropriate for this facility. Banding (if used) to create a horizontal layering can be accomplished through the use of soldier coursing and color changes. Additional banding can be accomplished by using continuous precast concrete sills and lintels. Wall cavity shall have a 1" air gap. * Amendment #0001

3.3.1.6 The exterior wall along the flight line of the building must be reinforced masonry infill, precast panels, or cast in place concrete. This will provide protection from catastrophic flight line events.

3.3.2 Roof

3.3.2.1 The structural roof for the facility shall be metal decking on steel structural framing, painted where visible from ground level. The weathering and finished roof (finish color to match Base Facility Standards, baked-on or anodized finish) shall be a structural standing seam (2" vertical rib) metal roof system (SSSMR), with a concealed fastener system. The fasteners shall stand the roof off to incorporate the appropriate thickness of insulation and fire protection assemblies. The roof structure system shall slope toward continuous gutters. Design Build Contractor shall design the slope of the apparatus room such that it minimizes the potential for snow falling from the roof to the apparatus room driveway. Provide an assembly that complies with UL580 for wind uplift resistance and is approved as a UL Class-90 system with a 20-year weather tight warranty with watertight detailing.

3.3.2.2 Roof insulation shall be rigid, polyisocyanurate boards mechanically anchored to the protection board anchored to the structural metal deck of the facility. Provide a 6-mil thick vapor barrier to the topside of gypsum protection board prior to the setting of the rigid insulation.

3.3.2.3 The SSSMR shall be laid on top of the rigid insulation. Roof panel seam-clips (hold-down clips) shall be anchored directly into the metal decking and shall be strong enough to satisfy the uplift requirements.

3.3.2.4 Provide a lockable attic access hatch for each enclosed attic space. D/B Contractor must provide direct stair access to any roof with a slope of 4/12 or less.

3.3.2.5 Any areas where the roof structure is exposed shall be provided with a metal soffit to enclose the structure and provide a finished building appearance.

3.3.2.6 Gutters and downspouts shall be designed in accordance with SMACNA and factory finished to match exterior finish scheme (baked-on or anodized).

3.3.2.7 Provide metal through-wall flashing. Do not use membrane-type flashing.

3.3.3 Windows

3.3.3.1 Frames for the windows shall be thermally broken aluminum for 1" thick insulated glass units. The profile shall be nominal 1¾" to 2" wide face by 5 1/2" to 5" deep, be exterior glazed and have a face cap of not more than ¾" deep. The frames shall have an anodized factory finish to meet Base Facility Standard color

3.3.3.2 The insulated glass units shall have an exterior glass pane ¼" thick glass laminated, ½" air space and ¼" thick laminated interior glass pane. The glass unit shall be Low-E and tinted bronze with a U-Value for Winter Night-K=1.74; Summer Daytime-K=1.88 Shading Coefficient=0.45 and Solar Heat Gain Coefficient= 0.39.

3.3.4 Doors and Frames

3.3.4.1 Exterior insulated steel doors shall be Grade-II, heavy duty, G60 galvanized, insulated and painted. Door sheet faces shall be 16 gauge. All double doors shall be provided with a removable astragal (center jamb) and weather-stripping.

3.3.4.2 Frames shall be 14 gauge, G60 steel and painted. Provide continuous rubber-bulb weather-stripping around frames, and provide rubber bottom seals on doors.

3.3.4.3 Hardware (Meets BHMA Standards for heavy duty and approved by ANSI): Ball bearing hinges; Lockset, mortise with lever handles; Closer, heavy duty; Overhead stop, heavy duty; 7 pin interchangeable cylinder; Threshold; Weather-stripping; Rain Drip.

3.3.5 Storefront System

3.3.5.1 Frames for the windows shall be thermally broken aluminum for 1" thick insulated glass units. The profile shall be nominal 1 ¾" to 2" wide face by 5½" to 5" deep, be exterior glazed and have a face cap of not more than ¾" deep. The frames shall have an anodized factory finish to meet Base Facility Standard color and shall be fixed (non-operable type).

3.3.5.2 The insulated glass units shall have an exterior glass pane ¼" thick glass laminated, ½" air space and ¼" thick laminated interior glass pane. The glass unit shall be Low-E and tinted bronze with a U-Value for Winter Night-K=1.74; Summer Daytime-K=1.88 Shading Coefficient=0.45 and Solar Heat Gain Coefficient= 0.39

3.3.5.3 Aluminum entrance doors will be medium style doors and the aluminum finish will match the storefront window framing. Insulated glass unit will also be the same.

3.3.5.4 Hardware (Meets BHMA Standards approved by ANSI): Ball bearing hinges; Lockset, mortise with lever handles; Closer, heavy duty; Overhead stops; pin interchangeable cylinder, keying to match base; Threshold; Weather-stripping; Panic devices, concealed vertical rods, touch bar type.

3.3.6 Exterior Metals

3.3.6.1 All exterior metal surfaces includes louvers, window frames, doors, door frames & associated framing, and other miscellaneous exposed metals. Provide factory applied baked-on or anodized finish.

3.4 INTERIOR BUILDING CONSTRUCTION

3.4.1 Interior Doors

3.4.1.1 All steel frames are to be of 14 gauge steel.

3.4.1.2 All solid core wood doors, natural finish wood veneer (book matched); Conform to NWWDA I. S. 1-A; Typical size: 36" x 84", with stainless steel kick plates for protection.

3.4.1.3 Door Hardware shall be stainless steel (US32D). All locks shall be compatible with Base Standard - "Best" system. Hardware (Meets BHMA Standards for heavy duty and be approved by ANSI): Ball bearing hinges; Lockset, mortise with lever handles, Grade 1, Series 1000; Cores: 7 pin interchangeable cylinders; Closers on all rated doors and other selected locations; Floor stops, wall stops or overhead stops.

3.4.1.4 Access Doors shall be provided for plumbing chases and equipment access. Doors shall be approved for the wall material they are installed in.

3.4.2 Interior Partitions

3.4.2.1 Metal Studs, Furring Channels and Gypsum Wallboard: Metal studs and furring channels shall be minimum G60 hot dipped galvanized steel, 20 gauge before galvanization and spaced at maximum 16" on center at interior stud partitions and 16" for furring channels. Partitions shall receive ½" thick gypsum wallboard. Ceilings and interior soffits/bulkheads shall receive ½" thick gypsum board. All gypsum board shall have tapered or beveled edges. Provide fire resistance rated type gypsum board at fire rated partitions. Provide moisture

resistant type gypsum board at 'wet' walls (walls with water present, including base cabinets with sinks and drinking fountains). Provide ½" thick cement boards on the 'built-up' shower/tub walls and on their ceilings. Drying areas adjacent to the showers shall receive moisture resistant type gypsum board on the walls and ceilings to be painted. All partitions and walls to receive ceramic tile finish shall receive tile backer boards as recommended by the gypsum board manufacturer. At full height partitions, extend the gypsum board and the sound insulation to underside of structural deck above. Provide a minimum of 2½" thick mineral fiber sound insulation between all studs (fit tight and secure with wire to prevent sagging).

3.4.2.2 Concrete Masonry: Masonry partitions shall be 8" nominal thickness. These partitions shall be structurally reinforced with steel reinforcing bars and horizontal joint reinforcing as required by the Federal, State and Local Codes/Regulations to include seismic and force protection. Doors, windows, frameless openings and outside corners of exposed block shall be bull-nosed edges.

3.4.3 Finishes

3.4.3.1 Ceramic Tile: Shall be provided in all restroom and shower areas and shall be a combination of 3/8" thick thin set type, class III abrasion resistant, .5 maximum water absorption, .5 minimum static coefficient of friction, set with organic adhesive. The ceramic tile shall be provided in a minimum of three sizes (4" x 4", 2" x 2" and 1" x 1" tiles) with ceramic base. Provide marble thresholds at door locations adjacent to ceramic tile flooring.

3.4.3.2 Resilient Floors: Resilient flooring shall be VCT, ASTM F 1066 Composition I. 3 colors of VCT shall be used to create a pattern and design that is complimentary of the respective room. Base shall be rubber type, straight in carpeted areas and cove type base in all other areas.

3.4.3.3 Carpet: Shall be carpet tile, multi colored loop and should be of a pattern and color that conceals stains and traffic wear. Pattern to be non-directional, with no linear or strong geometric patterns. 100% Dupont continuous filament, loop pile, static control. (Minimum requirements shall be met for carpet as set forth by; WP Base Facility Standards 3.11.2 and ETL 03-3 Air Force Carpet Standard)

3.4.3.4 Sealed Concrete Floors: All exposed concrete floors shall be sealed. The floors sealer should carry a minimum 5-year warranty.

3.4.3.5 Acoustic Tile Ceilings: Suspended acoustic tile ceilings shall be 24" x 48" scored for a 24" x 24" appearance or true 24" x 24" tiles. Suspension grid system shall be rated for heavy duty. Tiles in disinfecting facility, SCBA maintenance and repair, fire extinguisher storage, and laundry shall be vinyl faced for eased cleanability.

3.4.3.6 Painting: Shall be provided per the programming schedule (PT-1 Flat Latex, PT-3 Epoxy Paint, PT-4 Ceiling White Epoxy paint). One prime coat and two finish coats shall be provided. Paints shall have less than .06% Lead by weight, and shall not contain Zinc Chromate or Strontium Chromate Pigments. Provide low or no VOC painting systems. Colors to follow base standards or be selected by the client during design process.

3.4.4 Toilet Room Accessories

3.4.4.1 Restrooms: Full lavatory width glass mirror; Toilet paper dispenser; Grab Bars; Soap Dispenser, wall mounted; Recessed paper towel dispenser & waste receptacle; Feminine napkin disposal and dispenser, Coat Hooks. All items to be stainless steel no. 4 satin finish, unless otherwise noted and meet ADA requirements. Partitions should comply with Base Standard type and color.

3.4.4.2 Shower Accessories: Combination mirrors in drying area; Grab Bars (meet ADA requirements); Towel Bars, wall mounted; Robe Hook. Refer to the Air Force Fire Station Design Guide for additional requirements.

3.4.5 Visual Display Boards

3.4.5.1. Wall mounted wood framed, 42" x 72", dry erase board w/ integral marker trough.

3.4.5.2 Wall mounted wood framed, 42" x 72", tack board.

3.4.6 Signage

* Amendment #0001

3.4.6.1 Exterior building identification signage and controlled area signage shall be provided in accordance with UFC 30120-01 and the Base Facility Standard. * Amendment #0001

3.4.6.2 Interior signage shall comply with the current Air Force sign standard UFC 3-120-01 with sizes as follows:

Description and Size

Restroom 9" x 6"

Room Identification 6" x 6"

Office Identification 6" x 6"

Information: "In Case of Fire" 10" x 12"

Directional: 20" x 12"

Fire Extinguisher 10" x 12"

Freestanding Announcement 30" x 30"

3.4.7 Window Blinds and Sills

3.4.7.1 Window Blinds (BID OPTION #4) devices will be located at all windows. They will be 1" aluminum slats, manually operated with hand held wand and rope pull.

3.4.7.2 Windowsills will be a solid surface material.

3.4.8 Foot Grilles

3.4.8.1 Provide aluminum foot grilles in entry vestibules.

3.4.8.2 Aluminum Foot Grilles: Standard foot grille with extruded members, top surfaced tread rails, and as follows:

- Tread Rails: Extruded-aluminum frame.
- Tread Rail Spacing" 3/8" o.c. with 1/8" to 3/16" wide openings between treads.
- Aluminum Finish: Clear anodized.

- Top Surface: Fusion-bonded, level cut pile nylon carpet insert, 6 mm high, 28oz/sq yd.

3.4.8.3 Drainage Pit Applications: Provide manufacturer's special deep-pit frame and support extrusion system with intermediate support beams, sized and spaced as recommended by manufacturer for indicated spans and equipped with vinyl support cushions.

3.4.9 Fire Extinguisher Cabinets: Fully recessed or semi-recessed fire extinguisher cabinets with a stainless steel and glass finish shall be provided.

3.4.10 Cabinets and Millwork: Per the Air Force Fire Station Design Guide.

3.5 SPECIAL PROGRAMMING REQUIREMENTS

3.5.1 Building program and requirements should follow information within this document (Section 1020), the Building Programming Drawing and the US Air Force Fire Station Design Guide.

3.5.2 Alarm Communications Center

3.5.2.1 The communications control room and the dispatch room shall be designed as two adjoining spaces. There should be a privacy barrier separating the two spaces. The privacy barrier could be similar to a half height wall, extending from one wall to the center of the room. The back, continuous wall will hold shared resource information for base maps and files.

3.5.2.2 The following rooms shall have 12" access floor located throughout (access flooring shall be at the same elevation as the surrounding finished floors):

- Communications Control Room
- Dispatch Room
- Telecom / Computer Room
- Adjacent Electrical Room

3.5.2.3 The communications room and dispatch room shall have no exterior windows.

3.5.2.4 A electric keypad and electric strike should be provided on the Communications Room door and the main entrance door. The lock should be electrified and remotely controlled from within the room. Door should also be provided with a peephole viewer.

3.5.2.5 An "A"-phone should be provided on the wall adjacent to the door into the Communications/Dispatch room. The intercom system should be controlled from within the communications room.

3.5.2.6 A doorway shall be provided from the Dispatch Room to the Emergency Response Center.

3.5.3 Apparatus Room

3.5.3.1 The apparatus room shall have 7 bays housing 14 fire/emergency vehicles.

3.5.3.2 Each Bay in the apparatus room shall have 2 doors providing drive through capability for vehicles. All doors shall be a minimum of 14' wide and

18' tall to accommodate the largest vehicle (TI-3000 with "snozzle") to be housed in the facility.

3.5.3.3 The overhead doors shall be controlled from the Dispatch room and from within the Apparatus Room. They shall have the capability to all be opened at once, or individually opened or closed. The doors should also be tied into the emergency power and a quick manual open option, in case of power failure. The safety sensors for the doors shall be mounted at a height to align with the vehicle body not the wheels. One remote control shall be provided for each door for the use in vehicles. Doors shall be designed to fully open or close within 60 seconds.

3.5.3.4 No vehicle maintenance areas are required for this facility.

3.5.3.5 Provide the working sprinkler riser assembly in the Apparatus Room mounted at working height for training purposes.

3.5.4 Training Facility

3.5.4.1 Do NOT provide half court basketball court and sand volleyball court for exterior physical fitness. These areas are not required for this project.

3.5.4.2 Rear projection is not required for the training room.

3.5.5 Living Quarters

3.5.5.1 All private bedrooms shall be provided with 2 lockable closets (one per shift).

3.5.5.2 Visual and Audible alarms shall be provided in each room. Visual alarm should be activated prior to the Audible alarm per NFPA 72, fire alarm code.

3.5.6 Recreation / Dining

3.5.6.1 In serving area provide heat resistant countertop. Provide storage for utensils, plates, and glassware.

3.5.6.2 A serving line is not required for this facility. A serving area should be provided between the kitchen and dining area.

3.5.7 Administration

3.5.7.1 Refer to programming matrix for specific space requirements.

3.5.8 Maintenance Repair, Storage, and Support

3.5.8.1 Hose storage and drying area will not contain a hose dryer or provisions for hanging hose.

3.5.8.2 No fire extinguisher maintenance will be performed, storage only.

3.5.8.3 The agent storage room will contain eight (8) 55 gallon drums of AFFF and three (3) flammable storage cabinets. This room should be accessed from the exterior through a set of 3'-0" X 7'-0" double doors. The floor shall be constructed to create a spill containment (with floor sloping down away from the door threshold) sufficient to contain 110 gallons of liquid.

3.6 SPECIAL ITEMS

3.6.1 Brass Fireman's Pole

3.6.1.1 Remove existing 30 ft. long solid brass fireman's pole from the Fire Station, Building 30206. The pole shall be removed in one piece. The extent of damage to the original building must be discussed prior to removal. The hole in the second floor at the pole shall be closed with the same construction materials as the surrounding floor after removal. The brass pole shall be incorporated as a visible memorial element inside the new Fire Station. Develop design concepts during the Design Charette for consideration by the Government. Provide an engraved brass wall mounted plaque. Message on the plaque shall be as directed by the Government.

PART 4 - STRUCTURAL REQUIREMENTS

*3

4.1 BUILDING STRUCTURAL REQUIREMENTS:

4.1.1 General code provisions, dead, live, snow, seismic and wind loads shall be according to The International Building Code (IBC 2000) and UFC 1-200-01. Comply with antiterrorism requirements outlined herein.

4.1.2 The seismic Use Group and corresponding performance level will be:

Seismic Use Group: IIIE - an Essential Facility (Fire, Rescue, and Police). Structural Performance level should be Immediate Occupancy (IO) 3 Refer to TI 809-04 Seismic Use Group III and the 2000 International Building Code for further requirements. Occupancy Importance Factor (IE) shall be 1.50 per Table 1604.5 in the 2000 IBC.

4.1.3 Design loads and load combinations, except seismic shall be in accordance with the American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures, ASCE 7-latest edition. Seismic design shall be in accordance with UFC 1-200-1, T1809-04 "Seismic Design for Buildings" and the 2000 International Building Code.

*3

4.2 FOUNDATIONS

4.2.1 Foundation includes all substructure elements supporting the facility and its equipment. The minimum depth for heated sections is 36" and 42" for unheated sections.

4.2.2 Prepare the foundation design in accordance with the D/B Contractor's independently verified Geotechnical analysis of the site soil conditions performed by a licensed geotechnical engineer. Remove any uncontrolled fill and replace with structural fill. Replacement of uncontrolled fill will be addressed through a contract modification.

4.2.3 The foundation shall be designed according to the Foundation Design Criteria stated herein, including seismic, wind, live and gravity loads.

* Amendment #0001

4.2.4 NOT USED.

*Amendment #0001

4.3 SUPERSTRUCTURE

4.3.1 The superstructure includes the above grade structural elements required for support of the roof construction.

4.3.2 The structural design of building components shall conform to the design requirements stated herein, including seismic, wind, live and gravity loads.

4.3.3 All ground level floor construction shall be slab-on-grade over a compacted drainage layer and vapor barrier.

4.3.4 Structural wall elements required for support of roof construction includes steel columns, precast structural concrete wall panels, and load bearing masonry walls. Exterior wall elements will also function as lateral support for the building cladding.

4.3.5 Structural roof framing elements required for support of the roof construction is to be determined by the Design Build Contractor. Some examples are girder trusses, open web bar joist and girders, steel beams, prestressed-precast concrete planks and galvanized light-gauge metal framing. The roof slope shall be made in the structure. Roof slope may also be achieved over flat surfaces using galvanized steel truss system or galvanized light-gauge metal framing.

4.3.6 Structural roof system shall consist of a wide rib metal deck attached to structure below. The standing seam metal roofing system shall use and will connect to structure below using concealed fasteners. Minimum roof slope shall be $\frac{1}{4}$ " per foot for all roof areas. All metal decking shall be galvanized. The system shall be complete with expansion control joints including sleeved penetrations for services. Show method and frequency of attachment to structural framework.

4.3.7 Roof construction fire stopping material shall be installed in cavities, around pipe penetrations, and in other openings in roof construction to prevent spread of fire and smoke

4.3.8 Give special attention to control cracking in concrete masonry structures using the guidance contained in Table 1-1.

Table 1-1 Recommended Joint Control Spacing ^(a)

Vertical Spacing of Joint Reinforcement With 2-#9 Wires ^(b) (in)	Maximum Ratio of Panel Length to Wall Height (L/H) ^(c)	Maximum Spacing of Control Joints ^(d) (ft)
None ^(e)	2	18
16	3	24
8	4	30

^(a) Based on moisture-controlled, type I, concrete masonry in intermediate humidity conditions (ASTM C 90). The designer should adjust the control joint spacing for local conditions. The recommended spacing may be increased 6 ft. in humid climates and decreased 6 ft. in arid climates.
^(b) Joint reinforcement will be cold-drawn deformed wire with a minimum 9-gauge longitudinal wire size.
^(c) L is the horizontal distance between control joints. H is generally the vertical distance between structural supports.
^(d) The spacing will be reduced approximately 50% near masonry-bonded corners or other similar conditions where one end of the masonry panel is restrained.
^(e) Not recommended for walls exposed to view where control of cracking is important.

PART 5 - ANTITERRORISM FORCE PROTECTION CONSTRUCTION REQUIREMENTS

In accordance with DoD Antiterrorism Standards this building is classified as an "Essential Structure".

5.1 Standoff Distances:

5.1.1 The facility shall be designed as *conventional construction* meeting the minimum standoff distance of 82' from the face of the building to roadways and parking.

5.1.2 A 33' standoff distance between the building and dumpster location is required.

5.1.3 Standoff distance shall be measured from the controlled perimeter to the closest point on the building exterior. Measure the standoff distance from the closest edge of parking areas and roadways to the closest point on the building exterior. The minimum standoff regardless of hardening or analysis is 82' for both parking areas and roadways. Measure the standoff distance from the nearest point of the trash container or trash container enclosure to the closest point on the building exterior.

5.1.4 The open drive from the Fire Station's apparatus room to Skeel Avenue is considered mission necessary. Because of this classification, no gate or barrier will be required on the apparatus driveway to Skeel Avenue. All private vehicles access and parking must meet the required stand off distances.

5.2 Unobstructed Space:

5.2.1 Ensure that obstructions within 33' of the building do not allow for concealment from observation of explosive devices 6" or greater in height. This does not preclude the placement of site furnishings or plantings around buildings. It only requires conditions such that any explosive devices placed in that space would be observable by building occupants.

5.2.2 If outdoor mechanical and electrical equipment is located outside the "Unobstructed Space" area requirements it is not subject to antiterrorism construction requirements.

5.3 Building Overhangs:

5.3.1 Do not provide building overhangs with inhabited spaces above them where people could gain access to the area underneath the overhang.

5.4 Exterior Masonry Walls:

5.4.1 Un-reinforced masonry walls are prohibited for the exterior walls of new buildings. A minimum of 0.05 percent vertical reinforcement with a maximum spacing of 48" will be provided.

5.5 Windows and Glazed Doors:

5.5.1 To minimize hazards from flying glass fragments windows and frames must work as a system to ensure that their hazard mitigation is effective. These provisions apply even where minimum standoff distances are met.

5.5.2 Glazing: Use a minimum of ¼" nominal laminated glass for all exterior windows and glazed doors. The ¼" laminated glass consists of two nominal 1/8" glass panes bonded together with a minimum of a 1/32" polyvinyl-butyl (PVB) interlayer. For insulated glass units, use ¼" laminated glass inner and outer pane as a minimum.

5.5.3 Window and Glazed Door Frames: Provide window frames and mullions and sashes and door rails and stiles of aluminum or steel. Steel members may be designed using ultimate yield stresses and aluminum members may be designed based on 0.2% offset yield strength. Equivalent static design loads for windows and door members shall be 1lb. per square inch applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of the unsupported member lengths. The glazing shall have a minimum frame bite of 3/8" for structural glazed window systems and 1" for window systems that are not structurally glazed. Equivalent static design loads for connections of the window or doorframe to the surrounding walls or roof, hardware and associated connections, and glazing stop connections shall be 10.8 lbs per square inch for glazing panels with a vision area greater than 10.8 square feet and 4.4 lbs per square inch for glazing panels with vision area greater than 10.8 square feet but less than or equal to 32 square feet. Loads shall be applied to the surface of the glazing and frame. Connections and hardware may be designed based on ultimate strength for steel and 0.2% offset yield for aluminum. Design supporting wall and roof elements and their connections based on their ultimate capacities. In addition, because the resulting dynamic loads are likely to be dissipated through multiple mechanisms, it is not necessary to account for reactions from the supporting wall or roof elements in the design of the remainder of the structure. Alternatively, use frames that provide an equivalent level of performance.

5.6 Exterior Doors:

5.6.1 All exterior doors into inhabited areas shall open outwards.

5.7 Roof Access:

5.7.1 Design the building to control access to roofs to minimize the possibility of aggressors placing explosives or chemical, biological, or radiological agents there. No roof access points should be required for this facility.

5.8 HVAC SYSTEMS:

5.8.1 Air Intakes: Air intakes to heating, ventilation, and air conditioning (HVAC) systems shall be located a minimum of 10 feet above the ground.

5.8.2 Provide a separate, dedicated HVAC system for the Communications Control Dispatch and Telecom/Computer Rooms.

5.8.3 Emergency Air Distribution Shutoff: Provide an emergency shutoff switch in each HVAC control system that can immediately shut down air distribution. Locate the switch (or switches) to be easily accessible by building occupants.

5.9 Equipment Bracing:

5.9.1 Mount all overhead utilities and other fixtures weighing 30 lbs or more to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

5.11 Mass Notification

5.11.1 Provide an emergency public address system throughout all occupied areas of the building for notification of occupants of threats.

PART 6 - MECHANICAL**6.1 DESIGN CONDITIONS**

6.1.1 General: The D/B Contractor shall be responsible for preparing detailed load calculations and equipment selections during the design process. D/B Contractor is responsible for preparing an independent complete analysis (calculations and equipment selection) and design (drawings and specifications) for the building mechanical systems. The D/B Contractor shall submit cooling loads calculations justifying that the cooling equipment is capable of maintaining indoor requirements at both Outdoor Summer conditions listed below. The design build contractor shall analyze the makeup air system and determine the required systems to meet the Energy Usage Budget (EUB). Makeup air units may require cooling, heating, and sensible and latent energy recovery to meet the EUB. Makeup air units are only required as necessary to meet EUB requirements or as required to make the mechanical system functional.

6.1.2 Fire Station Spaces:

- Indoor Summer: 75.0°F db/50%RH
- Indoor Winter: 70.0°F db/No humidification
- Outdoor Summer: 92.0°F db/74.0°F wb and for
- High humidity conditions: 88.0°F db/78.0°F wb
- Outdoor Winter: 1.0°F db

- Ventilation (Outdoor Air): 20 cfm/person in office areas
15 cfm/person in all other occupied spaces

6.1.3 Utility Spaces and Apparatus Room

- Indoor Summer: 92.0°F db (ventilation only, no air conditioning)
- Indoor Winter: 68.0°F db
- Outdoor Summer: 92.0°F db/74.0°F wb
- Outdoor Winter: 1.0°F db

6.1.4 Energy Usage Budget

- EUB: 45 MBH/square foot/year
EUB based on 24 hrs/day, 7 days/wk

6.1.5 Furnish and install access doors in walls and ceilings where access is required to conceal mechanical equipment, valves, controls and other devices.

6.1.6 Provide commissioning for the project per Uniform Facilities Guide Specifications (UFGS) requirements. Commissioning shall be the responsibility of the General Contractor and shall include all parties listed in the UFGS including but not limited to the Mechanical Contractor.

6.1.7 Provide a carbon monoxide detection system in all spaces that have combustion equipment.

6.2 HEATING WATER SYSTEM

6.2.1 The heating energy source will be the central district (70 psi) steam which is available during the heating season of 1 October through 1 May. Steam will enter the main mechanical room and be converted to low temperature hot water (LTHW). LTHW will be distributed to serve the heating requirements of the building. Provide a heat exchanger with a pumping system to convert the steam source to LTHW. Each pump shall have a standby that automatically functions when the primary pump fails to operate. A current sensor will be used to verify pump failure. The tube bundles that are integral with the heat exchangers shall be made of CuNi.

6.2.1.1 The steam to LTHW generator shall be sized/selected to allow future connection to the district high temperature hot water system (HTHW). The HTHW system operates at 400 psi and 350°F. The heat exchanger must be selected for steam in the tubes with an oversized condensate nozzle to allow for the future transition to HTHW. Provide HTHW branch piping mains insulated, capped and stubbed out 5'-0" beyond building for future connection. Allow space in mechanical room at HTHW piping termination for future valving and connection to heat exchanger.

6.2.1.2 Provide a chemical shot feeder in the LTHW system with appropriate system chemicals. Water treatment shall comply with the equipment component manufacturers requirements. Provide strainers at each pump.

6.2.2 The air handling units, unit heaters and the fan coil units shall be served by low temperature hot water (LTHW).

6.2.3 Provide recessed hydronic cabinet heaters at each entry and exit.

6.2.3.1 Cabinet heaters shall include a minimum 18 gauge galvanized steel enclosure with 12mm thick fibrous glass insulation and painted with corrosion resistant coating, coil assembly constructed of copper tubes and aluminum fins, 25mm throwaway filters, centrifugal direct drive fan assembly and motor controller. Provide removable panels or access doors for access to all interior components.

6.2.4 Steam and condensate piping shall be schedule 80 steel to allow for a future switchover to high temperature hot water. Select piping for the worst-case applied temperature and pressure conditions. Provide galvanic couplings for dissimilar materials.

6.2.5 Low temperature hot water piping shall be type K or L copper. Select piping for the applied temperature and pressure conditions. Provide galvanic couplings for dissimilar materials.

6.2.6 Piping shall be insulated with fiberglass and factory-applied cover.

6.2.7 Size piping for nominal water velocity of 5.0 fps, not to exceed 8.0 fps velocity nor exceed 6.0 ft per 100 ft of pipe pressure drop.

6.2.8 Provide a bubble tight gate valve in the steam supply and condensate return lines at the entry point to the main mechanical room. Provide a bypass with globe valve at this entry point.

6.2.9 Provide a full port ball positive shutoff valve in the LTHW supply and return lines at the heat exchanger. Provide a bypass with globe valve for each of these entry points.

6.2.10 Pumps

6.2.10.1 Provide centrifugal circulating pumps with motor, motor starter, and motor enclosure conforming to the appropriate NEMA standards. All circulating pumps shall be base mounted and installed on 4" housekeeping pad. Provide suction diffusers on all pumps. Pump motor efficiencies shall meet or exceed that listed for FEMP or ENERGYSTAR, or as listed in ASHRAE 90.1, whichever is greatest. Provide backup pump to operate in a lead/lag configuration with automatic startup of second pump upon first pump failure. Use current sensors to detect pump failures and alarm DDC system.

6.2.10.2 Select pumps so that the operating point on selected impeller curve will lie at or to the shutoff side of, and not more than 5 percent below, point of maximum efficiency for impeller.

6.2.10.3 Insulate pumps used for hot service with 2" thick preformed mineral fiber insulation. Insulate pumps by forming a box around pump housing, drive shaft, and piping. Apply insulation to inside surfaces of 20-gage galvanized sheet metal boxes having openings for drive shaft and pipes. Construct box to be easily disassembled to facilitate pump maintenance.

6.2.10.4 All pumps require suction strainers, shutoff valves on inlets and outlets and pressure gauges (inlet and outlet). Provide thermometers on inlets and outlets of each piece of heat-exchanging equipment and supply/return lines to each facility.

6.2.10.5 Align pumps to meet manufacturers written requirements.

6.2.10.6 Provide a calibrated balancing valve at each hydronic heating device.

6.3 CHILLED WATER SYSTEM

6.3.1 Provide an air-cooled chiller to supply chilled water to the building fan coil units and air-handling unit. The chiller pumps shall be constant volume. There shall be a standby pump that automatically functions when the primary pump fails to operate. Pumps shall be located in the main mechanical room.

6.3.2 System Requirements

6.3.2.1 Total system chilled water volume shall be a minimum of 7 gallons per ton of cooling. Provide an insulated, baffled storage tank, if required, to meet this requirement.

6.3.2.2 Provide a calibrated balancing valve at each hydronic cooling device.

6.3.2.4 Provide foundations and clearances per manufacturer's recommendations.

6.3.3 Air-Cooled Chillers

6.3.3.1 Air-cooled rotary screw, slide valve modulation type per ARI 550/590-98. Chiller efficiencies shall meet or exceed that listed for FEMP or ENERGYSTAR, or as listed in ASHRAE 90.1, whichever is greatest.

6.3.3.2 Provide a minimum of two (2) independent refrigerant circuits per chiller.

6.3.3.3 Provide copper tube, aluminum fins for condenser coils

6.3.3.4 Control panel with indication of discharge pressure and suction pressure, separate high pressure cutout with manual reset, separate low pressure cutout, low water temperature cutout with manual reset, compressor operating control and manual off-auto switch. Provide signal lights or other visual "failed" indications for high pressure, low pressure, and oil pressure protection devices. Provide a minimum two-minute time delay to prevent compressors from short cycling whenever stopped by safeties. Provide a control interface for remote monitoring of the chiller's operating parameters, functions and alarms from the DDC control system central workstation. As a minimum the following points shall be monitored and/or controlled from the DDC system: Entering and leaving chilled water temperature, Self-diagnostics, Operation status, Operating hours, Number of starts, Compressor status (on or off), Refrigerant discharge and suction pressure, Oil pressure, Flow status, Entering and leaving chilled water temperature set points.

6.3.4 Insulate chilled water equipment as suitable for the temperature and service in cellular glass or flexible unicellular insulation to fit as closely as possible to equipment. Provide vapor barrier as required for the application.

6.3.5 Chiller Start-Up and Operational Tests.

6.3.5.1 Prior to chiller start-up, flush piping systems and place water treatment systems in operation.

6.3.5.2 Place the chillers in operation under the direction of the manufacturer's representative. Record manufacturer's recommended readings

hourly for a period of not less than 3 days. Provide a detailed description of chiller start-up and operational tests.

6.3.6 Chilled water piping inside the buildings shall be schedule 40 steel or type K or L copper. Select piping for the applied temperature and pressure conditions.

6.3.7 Piping shall be insulated with cellular glass insulation and factory-applied cover.

6.3.8 Size piping for nominal water velocity of 5.0 fps, not to exceed 8.0 fps velocity nor exceed 6.0 ft per 100 ft of pipe pressure drop.

6.3.9 Select a 30% ethylene-glycol solution for the chilled water system. Piping and equipment shall be designed to be safe from freezing during winter operation. Draining the cooling system is not an acceptable freeze protection option.

6.3.10 Provide a full port ball type, positive shutoff valve in the chilled water supply and return lines at the entry point to the main mechanical room.

6.3.11 Pumps

6.3.11.1 Provide centrifugal circulating pumps with motor, motor starter, and motor enclosure conforming to the appropriate NEMA standards. All circulating pumps shall be base mounted and installed on 4" housekeeping pads. Provide suction diffusers on all pumps. Pump motor efficiencies shall meet or exceed that listed for FEMP or ENERGYSTAR, or as listed in ASHRAE 90.1, whichever is greatest. Provide backup pump to operate in a lead/lag configuration with automatic startup of second pump upon first pump failure. Use current sensors to detect pump failures and alarm DDC system.

6.3.11.2 Select pumps so that the operating point on selected impeller curve will lie at or to the shutoff side of, and not more than 5 percent below, point of maximum efficiency for impeller.

6.3.11.3 Insulate pumps used for chilled water service with 2 inches thick cellular glass insulation. Insulate pumps by forming a box around pump housing, drive shaft, and piping. Apply insulation to inside surfaces of 20-gage galvanized sheet metal boxes having openings for drive shaft and pipes. Construct box to be easily disassembled to facilitate pump maintenance.

6.3.11.4 All pumps require suction strainers, shutoff valves on inlets, check valve and balance valve (or triple-duty valve) on outlet and pressure gauges (inlet and outlet). Provide thermometers on inlets and outlets of each piece of heat-exchanging equipment and supply/return lines to each facility.

6.3.11.5 Align pumps to meet manufacturers written requirements.

6.4 AIR HANDLING SYSTEMS

6.4.1 General

6.4.1.1 The heating coil section and outdoor piping shall be designed to be safe from freezing during winter operation.

6.4.1.2 The cooling coil section and outdoor piping shall be designed to be safe from freezing during winter operation. Draining the chilled water system is not an acceptable freeze protection option.

6.4.1.3 Fans shall be AMCA 210 certified, with AMCA seal.

6.4.1.4 Provide louver with bird screen on outdoor inlets and outlets.

6.4.2 Independent HVAC Unit for Communications Control Room, Dispatch Room and Telecom/Computer Room

6.4.2.1 Provide self-contained computer room air conditioning unit (CRACU) unit designed, factory assembled and factory tested. Unit shall be UL or ETL listed for computer room application. Unit shall include room cabinet and frame, floor stand, fan section, filter section, cooling coil, electric reheat coil, self-contained humidifier, compressors, remote air-cooled condenser(s), controls, and interconnecting piping to the CRACU.

6.4.2.2 Provide microprocessor control system integral with unit including electronic control center, control valves, sensors, wiring, and other appurtenances for workable system. Provide access panel or door in front of unit. Isolate electronic control center from conditioned airstream to allow service while system is in operation. Provide control sensors in unit for cooling, heating, dehumidifying, and humidifying. High-voltage circuits in system shall have individual leg overload protection. Starters, contactors, and relays shall be controlled by 24 volt control circuit. High-voltage circuit components shall be protected by safety lock, dead-front panel. Mount nonautomatic, molded-case circuit breaker in high-voltage section of electrical panel. Operating mechanism shall prevent access to high-voltage electrical components until switched to "OFF" position.

6.4.2.3 Provide a controls interface on CRACU to enable the DDC system to monitor the following operating parameters and alarm conditions: high and low computer room temperature, relative humidity, CRACU status.

6.4.3 Double Wall Air Handling Unit

6.4.3.1 The air-handling unit shall be located in the mechanical room.

6.4.3.2 Air-handling unit shall be factory fabricated triple-deck multizone style, double wall modular type and include heating and cooling coils and return air bypass deck, galvanized coil casings, stainless steel drain pans, valve and piping package, minimum ventilation air intake arrangement that allows for constant volume outdoor air intake and full economizer operation, air filters, fans, motors, motor disconnect switches, and casing. Each unit shall be fastened securely to the building structure.

6.4.3.3 Unit insulation shall be 2 inches thick, 1.5-lb/ft³ density sandwiched between two sheets of solid galvanized steel (minimum 18 gauge outer and 20 gauge inner). Coils shall be copper tube, aluminum fin type provided by the air handling unit manufacturer.

6.4.3.4 Construct casings of steel, galvanized steel, or aluminum on channel base coated externally with manufacturers standard finish. Provide access doors for inspection and access to internal parts.

6.4.3.5 Dampers shall be premium low leakage with galvanized steel double-skin airfoil design blades, vinyl bulb blade seals and stainless steel jamb seals in

galvanized frame, in parallel or opposed blade arrangement with non-slip keyed connecting rods and linkages. Maximum leakage rate shall be 2 cfm/ft² at 1 in. wg differential pressure.

6.4.3.6 Supply Fan and Return/Relief Fan Sections: Centrifugal fans with V-belt drive motor, adjustable, with belt guards for external mounted motors. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions.

6.4.3.7 Vibration Isolation: For the entire fan, motor, and drive assembly, provide vibration isolators to meet the NC criteria for each space.

6.4.3.8 Filter Sections: Protect permanent holding frames with rust inhibitor coating. Provide visible identification on media frames showing model number and airflow direction. Provide a means of sealing the filter bank to prevent bypass of unfiltered air. Performance shall be determined in accordance with ASHRAE 52. Provide included-type manometers for filter sections.

6.4.3.9 Replaceable Air Filters: UL 900, Class 2, those which, when clean, burn moderately when attached by flame or emit moderate amount of smoke, or both with throwaway frames and media. Provide 4 in. nominal thickness, with average efficiency of 60-65% an arrestance of 97% and a minimum MERV of 11 when tested according to ASHRAE Standard 52.1 and 52.2.

6.4.3.10 Heating and Cooling Coils: Provide removable coils per ARI 410 with access to one side. Enclose heating and cooling coils in casing with headers and return bends fully contained within casing. Cooling coils shall have stainless steel drain pans with piping connections to remove condensate. Seal coils to casing to prevent leakage of air around coils.

6.4.3.11 Unit shall include a discharge sound attenuator as required to maintain NC 35 in occupied spaces.

6.4.3.12 Provide zoning such that rooms in the same zone are similarly loaded and have the same exposure/envelope characteristics. Locate the zone thermostat in an area representative of the rooms in the zone. Size zones to minimize the range of airflows across zones. Provide a minimum of nine (9) zones with additional zones as required to balance the zone airflow range. Provide scheduling/reset control of hot deck and cold deck temperatures to avoid wide fluctuations in control.

6.4.3.13 Provide a heat recovery wheel or precooling coil for the outdoor airstream to provide dehumidification during mild, muggy weather.

6.4.4 Mechanical and Electrical Room Heat and Ventilation

6.4.4.1 Heat and ventilate mechanical and electrical equipment rooms as appropriate to maintain temperature. Use unit heaters with LTHW as heating source.

6.4.4.2 Unit heaters shall include three-position (on-off-auto) selector switch and thermostat control.

6.4.5 Ductwork Design

6.4.5.1 Rigid Ductwork: Except as allowed or required herein, all ductwork shall be constructed of galvanized steel in accordance with SMACNA Duct Construction Standards, with all seams and joints sealed with duct sealer.

Sheet metal fitting elbows shall have an r/d of 1.5; other fittings shall be made to allow for low-pressure drop.

6.4.5.2 Flexible Ductwork and Connectors: Flexible duct may be used only for connections to air distribution devices to adapt to minor offsets. Flexible duct shall be UL 181 listed and in accordance with SMACNA DCS. Provide the minimum length required to make connections, but not greater than 5 feet, with not more than 3 feet unsupported length. Bends shall be at a radius to diameter ratio of 1.5, minimum. Provide flexible connectors between fans and ducts. Flexible ductwork insulation shall be ASTM C 553 Type 1, Class B-2, 1 in. thick, 0.75 lbs/ft³ density insulation.

6.4.5.3 Insulation: Insulate rigid ductwork with fiberglass insulation; insulation shall have a factory-applied cover. Insulation in exposed areas including equipment rooms shall be rigid board type and insulation in concealed areas shall be flexible blanket type. All supply, return and outside air ductwork shall be insulated. Ducts subject to condensation shall be insulated and provided with vapor seal.

6.4.5.4 Sizing: Size ductwork using equal friction criteria. Size supply air ductwork to not exceed 0.10" H₂O/100 feet of duct pressure drop. Size return, outdoor, relief and exhaust ductwork to not exceed 0.08" H₂O/100 feet of duct pressure drop. Air velocity should not exceed 1575 fpm velocity.

6.4.6 Inline centrifugal exhaust fans: Provide centrifugal V-belt fans in housings. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Mount motors out of air stream. Provide flexible duct connectors and spring type vibration isolation for fan assembly.

6.4.7 Miscellaneous Exhaust Systems: Provide a ducted exhaust system to serve the restrooms, showers and janitor's closet. Provide separate ducted exhaust systems to serve other areas requiring exhaust as defined in the fire station design guide. One system shall serve the protective clothing lockers, protective clothing laundry and disinfecting facility. Another exhaust system shall serve the physical fitness room, physical therapy room, vending and similar areas. Provide another exhaust system to serve the mechanical/electrical room. The exhaust air shall be used for energy recovery in the facility if required to meet the EUB. Provide accessible dampers for balancing of the systems where a central exhaust is used.

6.4.8 Apparatus Room Exhaust: Provide ventilation of vehicle exhaust from Apparatus room to comply with NFPA 1500. Provide ductwork to pull exhaust from the floor level as well as the ceiling. The Base Fire Department has determined that a direct capture exhaust system is not acceptable. Provide automatic interlocked means for makeup air. Provide a minimum of two exhaust fans with variable frequency drives for zoned control.

6.4.8.1 Provide an electronic, fully automatic carbon monoxide (CO) and diesel fume detection and control system with both infrared CO and electrochemical cell NO₂ sensors with remote sampling capability, filters, transmitters, self-diagnostics, local and remote alarms, building DDC system supervision and controller for intermittent, modulating operation of Apparatus room ventilation equipment (including control of open-closed makeup air dampers) based on pollutant concentration with thermostat control and manual override for summer ventilation. Exhaust fans shall start at half-speed (adjustable) in response to any of the following conditions: a 35 ppm CO level measured in the Apparatus room, a 1 ppm NO₂ level measured in the Apparatus room, based on thermostat setpoint in Apparatus room, building DDC signal to start or manual start at

control panel. Fan speed shall be modulated proportional to the increase in Apparatus room contaminant concentration levels up to the alarm setpoint, 100 ppm CO and 3 ppm NO₂ (adjustable setpoint and time delay function).

6.4.9 Kitchen Hood Exhaust: Provide a filter type hood and ducted exhaust system to serve the kitchen appliances. The exhaust air shall be ducted to outdoors. Kitchen hoods shall completely cover the cooking equipment and overhang a minimum of 6 in on each end and 12 in front of the equipment. The hoods shall be UL listed per UL 710, NSF approved, pre-engineered and factory fabricated in accordance with the hood manufacturer's listing procedure and NFPA 96. Hoods and ductwork shall be constructed of 18-ga stainless steel with welded, liquid tight seams.

6.4.9.1 Provide a UL listed, wet chemical, Class K, automatic fire suppression system for hoods, ducts and cooking appliances. Provide Schedule 40 piping (chrome plated or stainless steel), signal devices, release assembly, detectors, fusible links, nozzles, blow-off caps, agent cylinders, liquid tight fittings, remote manual pull station, auto fuel cut-off and other appurtenances necessary for totally integrated, operational system. Design, manufacture and install in accordance with NFPA 17A, NFPA 96 and UL 300. Provide automatic mechanical or electrical fuel shut-off and double-throw micro switch for activation of a shunt trip breaker for electric power shut-off for appliances protected. Fuel shut-off to operate upon activation of system.

6.4.9.2 Exposed piping is not acceptable, with the exception of appliance drops.

6.4.10 Dryer exhaust: Provide a separate ducted exhaust system to serve each clothes dryer. The exhaust air shall be ducted to outdoors. Ducts shall be a maximum 20 ft long with no more than three right angle elbows (with minimum radius of 6 in) and have a maximum vertical run of 12 ft. If total equivalent length exceeds the maximum, provide a booster fan interlocked to operate when the clothes dryer is running. The ducts shall be rigid aluminum or stainless steel with exterior wall cap and back draft damper.

6.4.10.1 Means shall be provided for cleaning out the entire length of dryer exhaust vent ducts. Dryer exhaust vents shall not run through non-accessible spaces.

6.4.10.2 Provide a separate ducted exhaust and makeup air system to serve the personal protective gear dryer.

6.4.10.3 Dryer vents shall not exhaust near outdoor air intakes, air conditioning condensing units, entry doors or patios.

6.4.11 Provide factory-finished grilles, registers, and diffusers constructed of steel or aluminum. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded. All registers and diffusers shall be provided with factory-fabricated volume dampers, unless individually served by a dedicated branch duct having a manual volume damper at the branch takeoff.

6.4.12 Outdoor air intake and exhaust louvers: Shall be extruded aluminum and designed to prevent the entry of rain or snow. Intakes shall be a minimum of 10.0 feet from the nearest exhaust outlet and exterior mechanical equipment. Intakes shall be located to prevent pulling in vehicle and plane exhaust emissions. Provide bird screens at all louvers.

6.4.13 Ductwork: Where routed exposed shall interface with the architecture in an aesthetically pleasing manner.

6.4.14 Dampers: For low-pressure rectangular duct systems, use 45-degree entries into branches from the main duct. Provide manual volume dampers in each branch take-off from the main duct. Provide manual volume dampers in each branch take-off from the main duct to control branch air quantity. Dampers shall conform to SMACNA Duct Construction Standards.

6.4.15 Fire Dampers: Provide in accordance with UL 555. Fire dampers shall be dynamic type rated for closure against a moving air stream.

6.4.16 Return air plenums: Are not permitted in any areas of the building.

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6.4.17 Supplemental Heat: For the zones that serve sleeping rooms and shower areas, provide electric duct heating coils to maintain design temperature when central steam is not available. Derate coils based on duct velocity. Provide duct access for cleaning coils without removing heater. Provide controls to individually enable each zone coil when hot water heat is not available.

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6.5 APPARATUS ROOM HEATERS

6.5.1 Provide gas-fired radiant heaters complying with ANSI Z83.6 and labeled by AGA. Heaters shall have power gas burners with electronic spark ignition, combustion air ducted directly from outside and power vacuum vented to the outdoors. Polished aluminum reflectors shall be shaped to control radiation for uniform intensity at floor level and provide 100% cutoff above centerline of tubing. Coordinate heater locations with items that may be sensitive to the heat generated, providing deflectors/shields as required.

6.5.2 Provide a building zone controller to accommodate a minimum four (4) temperature zones, vacuum pumps, temperature sensors, control transformer(s) and fire safety shutoff/interlock. Controller shall have seven-day clock and battery backup, security protection via password, night setback with ramp up optimization and remote monitoring by building DDC system.

6.5.3 Provide condensate piping to floor drain.

6.6 NOISE CRITERIA

6.6.1 General building mechanical systems shall be designed to an NC 35 for all occupied spaces.

6.7 CONTROL SYSTEM

6.7.1 The building shall have a Direct Digital Controls (DDC) system with electric or electronic operators for dampers and valves. System shall be compatible with and connected to the existing base system via the base LAN. Use wall mounted temperature sensors with a +/- 3 deg occupant offset adjustment. Coordinate locations of sensors and controllers with furniture.

6.7.2 DDC system shall monitor and control all HVAC and Plumbing equipment in the buildings. Meters shall be provided and monitored for steam, gas and electric. Provide monitoring for filters and energy recovery wheel pressure drops.

6.7.3 Controls shall be STAEFA or Johnson METASYS and be compatible with and connected to the base system.

6.8 PLUMBING

6.8.1 Domestic Cold and Hot Water

6.8.1.1 Provide a domestic water line to the building mechanical room. Provide reduced pressure type backflow preventer on the domestic service. A pressure-reducing valve assembly (with valved bypass) shall be provided in the cold water main where system pressures exceed 60 psig.

6.8.1.2 Above ground domestic water piping shall be type L copper.

6.8.1.3 Size piping for nominal water velocity of 5.0 fps, not to exceed 8.0 fps velocity nor exceed 6 ft/100' of pipe pressure drop.

6.8.1.4 Insulate domestic hot water supply and return piping with mineral fiber insulation. Insulate domestic cold-water piping with cellular glass insulation. All piping subject to condensation shall require a vapor barrier.

6.8.1.5 Provide full port ball shut off valve at each branch takeoff to toilet rooms, bathrooms, janitor's closets, kitchen and apparatus room. Provide valves at each water heater. Provide separate valved branch to 3" truck fill line in the Apparatus Room.

6.8.1.6 Water Heater: An industrial, high recovery, gas water heater will furnish domestic hot water for the building. Storage and recovery shall be sized to satisfy the shower load for all occupants within a 45-minute period. Hot water storage shall be in a glass-lined storage tank with an integral insulating jacket (R=5) and appropriate pumping system to keep the tank hot. Domestic water will be stored at 140°F. The water heater efficiency shall be in the upper 25% of what is available. The water heater will be located in the building mechanical room and water will be circulated to serve the entire building.

6.8.1.7 Provide recirculated domestic hot water system to maintain hot water to fixtures. Lavatories, showers and kitchen sinks shall be no farther than 20 feet from hot loop.

6.8.1.8 Water Softening: Treatment equipment shall be installed for domestic water. Local water has a hardness value of approximately 21 grains per gallon. Water softening equipment will consist of two or more resin exchange softener units, a regeneration brine tank utilizing common salt (NaCl) for regeneration of the softener exchange material, storage tank to supply peak demand, interconnecting piping, meter, pump, accessories and controls for automatic regeneration based on water usage.

6.8.1.9 Provide freeze proof wall hydrants at 100 feet intervals on all exterior walls.

6.8.1.10 Provide reduced pressure backflow preventer, meter and pressure regulating valves on the domestic water makeup to the hydronic heating and cooling systems.

6.8.1.11 Carbonated beverage dispensers will not be provided at the serving line on this project.

6.8.2 Roof Drainage

6.8.2.1 Roof drainage will be by external gutters and down spouts. Downspouts should be tied into storm drainage line.

6.8.3 Sanitary System

6.8.3.1 Provide a soil, waste and vent system for the toilet rooms, bathrooms, janitors closet, floor drains, kitchen equipment and other plumbing requirements in the buildings. Tie into the site sanitary system.

6.8.3.2 Sanitary system piping shall be either service weight cast iron or DWV copper. Exposed piping shall be chrome plated. Insulate exposed drains to fixtures for the handicapped and water cooler drains with insulation with factory-applied cover.

6.8.3.3 An oil separator is not required for the project. Vehicle maintenance will not be performed in the Apparatus Room. Protective clothing laundry waste shall go directly to the sanitary system.

6.8.3.4 Provide magnetic covers for floor drains and trench drains in the Apparatus Room.

6.8.4 Plumbing Fixtures

6.8.4.1 Install fixtures as required in the room matrix schedule and where required by the Fire Station Design Guide.

6.8.4.2 Provide a floor drain with trap primer in each of the spaces as defined in the building-programming matrix.

6.8.4.3 Provide new vitreous china, nonabsorbent, commercial quality fixtures free of cracks, blisters, thin spots or other flaws. Fixtures for the physically handicapped shall be in accordance with ADA requirements.

6.8.4.4 Faucets and trim shall be cast brass with chrome finished and ceramic disk valve technology. Faucets shall be provided with all-metal waterways.

6.8.4.5 Carriers shall be provided for wall mounted water closets, lavatories, and water coolers.

6.8.4.6 Provide a washer box for clothes washers.

6.8.4.7 Provide a cleanout (full diameter of piping it is connected to) for each plumbing fixture.

6.8.5 Plumbing Fixtures

6.8.5.1 Water closets: shall meet ADA, ASME A112.19.2M, shall be white, vitreous china, wall hung (with chair carrier), siphon jet, elongated bowl, top spud, and shall use 1.5 gals (maximum) per flush. Seat shall be white plastic open front. Flush valve shall be diaphragm type non-hold-open integral solenoid operator, back check angle control stop, vacuum breaker, infrared sensor operated valve with solid state electronic circuitry, include 24-volt transformer.

6.8.5.2 Flush Valve Type Urinals: ADA, ASME A112.19.2M, white vitreous china, wall-mounted (with chair carrier), wall outlet, siphon jet, integral trap, extended side shields. Water flushing volume of the flush valve and urinal combination shall not exceed 1.0 gals (maximum) per flush. Flush valve shall be diaphragm type non-hold-open integral solenoid operator, back check angle control stop, vacuum breaker, infrared sensor operated valve with solid state electronic circuitry, include 24-volt transformer.

6.8.5.3 Water Cooler shall meet ADA, be dual height unit, ARI 1010, wall mounted bubbler style with concealed chair carrier, air cooled condensing unit, 7.6 gph minimum capacity, stainless steel splash receptor and steel cabinet. Bubbler shall be controlled by push bar or touch pads.

6.8.5.4 Service Sink shall be pre-cast terrazzo floor mounted mop sink with stainless steel cap and 3 inch drain. Size shall be 24 in x 24 in x 12 in high. Faucet shall be chrome plated, wall mounted, copper alloy faucet using ceramic disc technology, with hose connection, vacuum breaker, and pail hook.

6.8.5.5 Lavatories shall be white, vitreous china, self-rimming type, minimum dimension 20 in x 17 in, installed in floor-mounted vanity. Faucet shall be sensor operated electronic type for tempered water including solenoid valve and transformer, have 4 inch centers, all cast brass one piece body and waterways; ceramic disc valve cartridge; adjustable hot limit safety stop; w/ pop up drain; 2.2 gpm flow restrictor (at 60 psi), chrome finish. Provide supply pipe with loose key stops and 17-ga-cast brass P trap with cleanout and tailpiece, chrome finish.

6.8.5.6 Kitchen sink shall be 63 in x 22 in x 10 in, 18 ga. 302 stainless steel, triple bowl, self rimming, bright satin finish, sound attenuating coating with six (6) faucet holes. Provide two (2) faucets with single lever control, metal lever handle, all brass and copper waterways; cast brass spout, ceramic disc valve cartridge; 2.5 gpm flow restrictor, w/o spray, chrome finish. Provide basket strainers, 17 ga. cast brass P-traps with cleanout and tailpiece. Supply pipe with loose key stops, chrome finish. Garbage disposal shall be 1.0 HP, stainless steel grinder chamber, permanently lubricated upper and lower bearings, quiet operation, and overload protection with manual reset.

6.8.5.7 Shower shall be 36 in x 36 in x 82 in minimum slip resistant bottom surface, integral toiletry/soap shelves, dome and grab bar one-piece acrylic with fiberglass reinforcement. Faucet shall be single lever control, pressure balancing, lever handle, all brass construction, cast brass diverter spout, ceramic disc valve cartridge, adjustable hot limit safety stop, check stops, 9.5L/s flow restrictor for shower, chrome finish. Provide 17 ga. cast brass P-trap.

6.8.5.8 Washer box shall be fabricated from 16-ga steel with epoxy finish. Unit shall have 1/2 in hot and cold water supply valves and 2 in. drain.

6.9 FIRE PROTECTION

6.9.1 Sprinkler Systems: Perform fire-hydrant flow test according to NFPA 13. Use results for system design calculations.

6.9.1.1 The building shall be fully sprinkler protected in accordance with NFPA 13 except the following shall be used as a minimum design requirement. Use a minimum density of 0.15 gpm/sf over the hydraulically most demanding 3,000 sf of floor area with a 500-gpm exterior hose stream.

6.9.1.2 Sprinklers shall be located so as not to protect over 130 sf area. Extended coverage heads are not acceptable. Where the Code allows a choice between quick response heads and standard response heads, the contractor shall use quick response heads. Use concealed type heads in areas with finished ceilings. Locate sprinkler heads in a consistent pattern with ceiling grid, lights, and air supply and return devices. Sprinklers shall be located in the center of the ceiling tile when installed in areas with lay-in ceilings.

6.9.1.3 Valves with tamper switches and flow switches shall be provided.

6.9.1.4 Provide a fire service water line with OS&Y valve to the building apparatus room. Provide a double check type backflow preventer and an alarm check valve. Provide adequate space around riser and check valves so that riser and check valves are easily serviced and locate in the Apparatus Room to allow for use in training firefighters. An exterior wall hydrant with splash block and OS&Y valve shall be provided to allow testing of backflow preventer at design flow as required by NFPA 13.

6.9.1.5 All bathrooms shall be fully sprinklered.

6.9.1.6 Where the possibility of freezing exists, dry pipe sprinkler protection shall be provided if required to provide complete protection.

6.9.1.7 Piping

6.9.1.7.1 Locate all piping so to eliminate risk of freeze damage. No piping shall be exposed to exterior conditions. All piping in areas with finished ceilings shall be concealed.

6.9.1.7.2 Piping shall be per NFPA 13 except as modified herein. Steel piping shall be Schedule 40. Sprinkler pipe and fittings shall be metal.

6.9.1.8 Connections to the building fire alarm system and electric alarm bell shall be made.

6.9.1.9 Provide concrete splash blocks at all drain discharge points subject to high water velocities, such as the main drain and inspector's test connection discharges.

PART 7 - ELECTRICAL

7.1 EXTERIOR LIGHTING

7.1.1 Parking Lot Lighting: Provide parking lot lighting with a general illumination level of 1 foot-candles. Lighting poles shall be spaced to provide a uniform lighting pattern and shall not obstruct traffic or parking spaces. Poles shall be 30 ft. aluminum. Light fixtures shall be sharp cutoff, pole mounted, and 19 inch square in extruded aluminum and finished in an architectural anodizing. Lamp source shall be metal halide. Control shall be via a lighting contactor with photocell and a Hand-Off-Auto switch.

7.1.2 Security / Egress Lighting: Provide building security / egress lighting at all entrances and exits from the building. Appropriate lighting levels shall be provided for exterior security camera locations. These fixtures will be provided for site lighting to ensure occupants have a means of safely moving between outdoor spaces. All fixtures shall be architectural type, selected to be compatible with the building architecture. Control shall be via a lighting contactor with photocell and a Hand-Off-Auto switch.

7.1.3 Utility Lighting: Provide security and maintenance lighting for outdoor mechanical/electrical courtyards. Lighting shall provide sufficient lighting to inspect equipment at night. A weatherproof switch located within the mechanical courtyard shall control lighting. Lighting fixture shall be a die-cast aluminum housing wall pack with a polycarbonate refractor with an incandescent lamp source.

7.1.4 D/B Contractor shall relocate existing street lighting and extend existing circuits on Skeel Avenue for new proposed driveway.

7.1.5 D/B Contractor shall provide electric and control wiring for new flashing emergency light over Skeel Avenue.

7.2 INTERIOR POWER

7.2.1 Main Electrical Service:

7.2.1.1 Provide a Service Entrance Rated Main Distribution Panel, with main breaker in the building Electrical Room. Service Entrance Panel shall be wall mounted, 480Y/277 volt, three phase.

7.2.1.2 Provide a minimum of 20% spare capacity and circuit breaker space in the Service Entrance Panel.

7.2.1.3 Transient Voltage Surge Suppression (TVSS): TVSS shall be provided on the main bus of the Service Entrance Panel.

7.2.2 Electrical Distribution System

7.2.2.1 Provide separate panel(s) for power, lighting and mechanical load requirements.

7.2.2.2 Provide a step down transformer(s) 480 volt primary to feed required equipment voltages. Electrical power panels and circuits shall be provided as required to meet the electrical system requirements.

7.2.2.3 Provide Square 'D' energy meter for incoming electrical service. Meter to have compatible connection to the Base Energy Management Center System (EMCS).

7.2.2.4 Provide provisions for a future Uninterruptible Power Supply (UPS) System with 15 minute battery back-up to support full operation of the Data Automation System, Alarm Communication Room, Electric Lock System, Radio Dispatch System, Fire Alarm Monitoring System, Intrusion Detection System (IDS), 911 System, Land Mobil Radio Equipment and all communication closets equipment. These provisions shall include providing a 120/208 volt, 3-phase, 42 pole, 100-amp panel board with 30 single pole 20 amp circuit breakers in the Main Electrical Room for future connection of all communications systems equipment. From this panel provide a vertical electrical surface mounted trough (flush with wall) to below raised floor.

7.2.2.5 Provide Surge protection and clean power for all computer room equipment in the Telecommunications/Computer Room

7.2.3 Electrical Equipment and Devices

7.2.3.1 Devices and equipment shall conform to the following regulatory documents:

- IEEE C37.13 Low-Voltage AC Power Circuit
- NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum)
- UL 489 Molded-Case Circuit Breakers and Circuit-Breaker Enclosure
- NEMA ST 20 Dry-Type Transformers for General Applications
- NEMA WD 1 General Requirements for Wiring Devices

7.2.4 Wiring Requirements

7.2.4.1 All conductors shall be copper. Branch circuit conductors shall not be smaller than No. 12 AWG.

7.2.4.2 Conductors for branch circuits of 120 Volts exceeding 100 feet in length from panel board to center of load shall be not smaller than No. 10 AWG. Conduit sizes are based on the use of type THHN insulation for conductors smaller than N0. 1/0 and type THWN for cables larger than No. 1/0.

7.2.4.3 Conductor identification shall be provided within each enclosure where a tap, splice or termination is made.

7.2.4.4 Provide a separate green ground conductor in each conduit.

7.2.4.5 All conductors shall be in conduit. EMT shall be use except where subjected to physical damage, then use Rigid Steel conduit.

7.2.4.6 Provide Arc-fault protection circuit breakers for all bedroom circuits.

7.2.5 Identification Requirements

7.2.5.1 Provide identification nameplates on the following equipment:

- Panel boards
- Motor Starters
- Safety Switches
- Transformers
- Equipment Enclosures
- Motors
- UPS
- Generator Set
- Automatic Transfer Switch

7.2.6 Panel boards

7.2.6.1 Provide a minimum of 20% spare bus capacity and circuit breaker space in all panel boards.

7.2.6.2 All panel boards shall be provided with copper busses and meet the AIC capacity required as demonstrated in the short circuit study performed by the Contractor. All new panels shall be bolt-on circuit breaker type and equipped with main breakers.

7.2.7 Receptacles

7.2.7.1 Receptacles shall be provided for general use and special equipment as necessary.

7.2.7.2 Provide one outlet on each wall of bedrooms.

7.2.7.3 Provide special power outlets and circuits for all user furnished equipment.

7.2.7.4 Provide a 120 V, self-retracting drop cord receptacle in Aperatus bay between each vehicle.

7.2.7.5 Receptacles: General use - 'Specification' grade, 20A, 120 V, grounding type meeting NEMA Standard WD-1 and Federal Specifications W-C-596.

7.3 LIGHTING

7.3.1 Fixtures

7.3.1.1. Fixtures Schedule: See Electrical Matrix for type locations.

- A 6 inch recessed fluorescent downlight with 18 watt, triple tube compact fluorescent. Ballast housing formed of steel, reflector aluminum positioned to duct light downward fixture shall have Fresnel glass lens and white trim ring. UL listed for wet locations.
- B 52 inch five blade ceiling fan with incandescent light kit and 3-speed fan control. Finish shall be antique brass. Blade shall be wood finish. Light kit shall be 200mm diameter round globe in white opal glass.
- C 2 feet x 4 feet fluorescent unit with 3-32 watt T8 lamps and a 1/8" thick smooth bottom prismatic acrylic lens.
Body made of 20 gauge (min) cold rolled steel, painted after fabrication with baked on white enamel with an 89% reflectivity (min). Body shall be welded to form a rigid assembly.
- D 2 feet x 4 feet recessed fluorescent unit with 3-32 watt T8 lamps and a 3" deep 18 cell semi-specular parabolic-shaped louver.
Body made of 20 gauge (min) cold rolled steel, painted after fabrication with baked on white enamel with a lengthwise shielding of 23 degrees and a crosswise shielding of 41 degrees (min). Body shall be welded to form a rigid assembly.
- E 1 foot x 4 feet fluorescent unit with 2-32 watt T8 lamps and a 1/8" thick smooth bottom prismatic acrylic lens.
Body made of 20 gauge (min) cold rolled steel, painted after fabrication with baked on white enamel with a lengthwise shielding of 23 degrees and a crosswise shielding of 41 degrees (min). Body shall be welded to form a rigid assembly.
- F Two lamp industrial fluorescent unit suspended by chain hangers. Reinforced 20 gauge steel channel with provisions for tong type sliding hangers. Channel shall be finished in baked on white enamel both inside and outside.
- G Recessed incandescent downlight fixture.
Die cast aluminum heat sink/housing with porcelain medium base socket. Reflector shall be specular hard coated aluminum at least 1.22mm thick. Multigroove bottom cone shall provide 45 degree cutoff and be easily removable to facilitate relamping. Plaster flange shall be die cast aluminum with a polycarbonate trim ring to cover rough ceiling opening.
- H 4 ft under cabinet, direct fluorescent unit with 2-32 watt T8 lamps and a 3.125mm thick 100% virgin clear acrylic plastic with an array of prismatic elements on one surface and smooth on the other.

Body made of 20 gauge (min) cold rolled steel, painted after fabrication with baked on white enamel. Seams shall be sealed or gasketed to prevent light leaks.

I 4 feet, one lamp bare fluorescent strip.
Die formed channel and cover of 20-gauge steel finished both inside and out with baked on white enamel.

J 2 feet x 4 feet fluorescent unit with 4-32 watt T8 lamps and a 1/8" thick smooth bottom prismatic acrylic lens.
Body made of 20 gauge (min) cold rolled steel, painted after fabrication with baked on white enamel with an 89% reflectivity (min). Body shall be welded to form a rigid assembly.

7.3.1.2 Parabolic fluorescent, lay-in fixtures in office area and conference rooms.

7.3.1.3 Lensed recessed troffers shall be provided in general spaces with ceilings.

7.3.1.4 Provide industrial strip fixtures with wire guard in general areas without ceilings such as, electrical, mechanical rooms.

7.3.1.5 Fixtures shall be equipped with high-Frequency electronic ballasts.

7.3.1.6 Fixtures shall use T-8 lamps with a correlated color temperature of 4100K and have a minimum Color Rendering Index (CRI) of 75.

7.3.1.7 Fixtures shall be switched in each individual room by wall switches at the entry door to the room.

7.3.1.8 Exit signs shall have lettering on an opaque background. Internally illuminated signs shall be light emitting diode (LED) type.

7.3.1.9 Provide a combination of parabolic lay-in fluorescent fixture and incandescent down lights in conference rooms. Incandescent fixtures shall be dimmed.

7.3.1.10 Provide incandescent down lighting and recessed lensed fluorescent in Day Room downlight fixtures shall be on dimmer switches.

7.3.1.11 Provide a combination of lens lay-in fluorescent fixture and incandescent down lights in sleeping rooms. Incandescent fixtures shall be dimmed. Center lamp of 3-lamp lay-in fluorescent fixture shall be connected to the All Call Intercom System in the Dispatch Center for visual notification during Dispatch sequence to alert firefighters of a response.

7.3.1.12 Provide residential incandescent lighting fixture over the bathroom mirror in private bathrooms.

7.3.1.13 Lay-in light fixtures connected to outlet box with 3/c #16 Armored Cable whip not to exceed 6 ft in length.

7.3.1.14 Illuminated exit signs and emergency lights shall be provided by self-contained emergency battery units for all emergency exits and passageways as required by the NFPA Life Safety Code No. 101.

7.3.2 Light Levels

7.3.2.1 Light levels shall be as recommended in the Illuminating Engineering Society of North America Handbook. Refer to room Matrix on for minimum foot-candle lighting levels.

7.3.3 Switches

7.3.3.1 Lighting switches - wall mounted - 'Specification' grade - single pole-3-way or 4-way as required-meeting Federal Specifications W-S-896- Ivory color

7.3.3.2 Dimmer switches - wall mount 'Specification' grade - Rating to match load applied.

7.3.3.3 No occupancy sensors to be provided.

7.4 SPECIAL SYSTEMS

7.4.1 Fire Alarm System

7.4.1.1 The fire alarm system will be an addressable intelligent system whose fire alarm control panel is located at the buildings main entrance. Key panels to a Master "B" keyway per Base Facility Standard. Provide connection from Knox Box tamper switch to FACP. Provide fire alarm control panel with a fan shutdown bypass switch. When operated, the switch will bypass the automatic fan shutdown capabilities of each zone. Operation of the switch shall cause the operation of the system trouble signal.

7.4.1.2 Provide addressable manual stations at each exterior man door for all common spaces. Keys shall match that of the fire alarm panel cabinet

7.4.1.3 Provide photoelectric type duct smoke detectors in all air-handling units as required by NFPA 90A. Activation of any duct smoke detector shall cause shut down of all air handler units in the associated floor or zone. Duct detector shall utilize sampling tubes that extend the width of the duct. Provide manometer testing of all housings to demonstrate satisfactory airflow.

7.4.1.4 Provide single station (photoelectric) line voltage powered smoke detectors with battery back up in each sleeping room. All detectors in each module shall be tandem interconnected for simultaneous operation such that a detector activation will sound an alarm throughout the Fire Station.

7.4.1.5 Provide sleeping room notification devices as required by NFPA 72 to provide "private mode" stipulated sound levels in sleeping rooms. Unit shall be powered by the building fire alarm system. Unit face shall be red in color.

7.4.1.6 Provide combination Audio-Visual devices throughout the facility as required by NFPA 72 and the ADA to provide NFPA 72 "public mode" stipulated sound levels in all spaces. Visual devices shall be synchronized when more than one device is located in a common field of view.

7.4.1.7 Provide connection to supervise PIV.

7.4.1.8 Fire Alarm System shall be installed in accordance with in accordance with the Base Facility Standard.

7.4.2 Data & Telephone System

7.4.2.1 All interior cabling shall be copper.

7.4.2.2 Interior Telephone cabling shall be Category 6.

7.4.2.3 Interior Data cabling shall be Category 6.

7.4.2.4 A completely operational cabling system including, but not limited to, all necessary raceway, cabling, terminations, jacks, patch panels, and faceplates shall be provided. All duplex outlets (voice/data) outlets will be 18 inches above finish floor (AFF) except wall telephone outlets will be 54 inches AFF. Voice and data will be in the same outlet. The cable for the outlet will be 4 pair, 24 AWG solid unshielded twisted pair (category 6) copper for voice and a 4 pair, 24 AWG solid unshielded twisted pair (category 6) for data. Termination of copper at instrument end will be in a RJ-45 jack (Category 6) for "voice" and RJ-45 jack (category 6) for "data". Termination at the communication room for both voice and data shall be on 110 type block 5E compliant termination panels (rack mounted). Coordinate with the Base Communication Group on the termination arrangements of the cables and the layouts of the patch panels in the equipment racks. All equipment racks shall be floor mounted. Final termination in the communication room shall be by Base Communication Group.

7.4.3 CATV

*** Amendment #0001**

7.4.3.1 D/B Contractor shall contract and coordinate directly with the local CATV system supplier (KAS TV) to provide cable service for the entire facility. D/B contractor shall provide a complete operational CATV system with outlets as indicated in the Programming Matrix. Contractor shall coordinate with the local cable company and pay any fees associated with the installation. * Amendment #0001

7.4.3.2 The cable for the CATV shall be RG-6 and the connector shall be a "F" type and terminated on splitters. All CATV headend equipment, incoming service, etc. shall be furnished and installed by the local Cable TV Company.

7.4.4 CCTV & Security Systems (Bid Option #2)

7.4.4.1 Provide a CCTV system for the entire facility. Installation of all conduit and cabling is part of the Base Bid. Furnish and install all equipment and devices and make final cabling terminations as part of Bid Option #2.

7.4.4.2 D/B contractor shall provide conduit and cabling for all CCTV equipment from equipment location to control devices.

7.4.4.3 Provide outdoor swivel/tilt/pan cameras as follows:

- Sufficient number of cameras to continuously monitor the entire perimeter of the building
- Sufficient number of cameras to monitor the outside of the Apparatus Room overhead vehicle doors

- Sufficient number of cameras, remotely located to monitor the immediate flight line ramp area

7.4.4.4 Provide fixed indoor cameras as follows:

- One camera outside the main door to the Alarm Communications Center
- One camera at the main building entrance vestibule
- Sufficient number of cameras to monitor the inside of the Apparatus Room overhead vehicle doors
- inside the building Provide empty conduit system with pull wire.

7.4.4.5 Provide additional cameras as required by the Air Force Fire Station Design Guide.

7.4.4.6 All CCTV controls and monitoring shall be located in the Alarm Communications Center.

7.4.4.7 Provide three (3) 27" flat screen monitors in the Alarm Communications Center for CCTV monitoring.

7.4.5 Door Controls

7.4.5.1 Provide an electric keypad with electric strike (electrified & remotely controlled) at the main door to the Alarm Communication Center and main door for the Building.

7.4.5.2 Provide control from the Alarm Communications Center to operate all Apparatus Room overhead vehicle doors at one time (open & close). Control should also provide the capability to open and close the doors individually.

7.4.6 Paging System

7.4.6.1 Provide paging capability throughout the entire facility. Ceiling/overhead speakers shall be located in each room with sufficient coverage to be audible under the normal operating conditions of that room.

7.4.6.2 Provide all call and individual room paging capability from the Alarm Communications Center.

7.4.7 Lightning Protection System

7.4.7.1 Provide a complete lightning protection system conforming to NFPA 780.

7.4.8 Grounding

7.4.8.1 Provide a complete building grounding counterpoise system complete with ground rods.

PART 8 - CONSTRUCTION CONSIDERATIONS AND USE OF PREMISES

8.1 SUMMARY

8.1.1 The requirements include

- Construction considerations and use of the premises.
- Protection of personnel and Government property.
- Construction facilities and job site standards.

- The requirements of this section apply to the entire project including all addenda or change orders that may be issued to modify the contract documents.

8.2 GENERAL INFORMATION

8.2.1 Construction Considerations

8.2.1.1 The superintendent in charge of this work shall personally contact the Base Civil Engineering Division, Building 11, Area C, and the Contracting Officer a minimum of 72 hours before starting site operations of the contract, before resumption of seasonal work, before restarting work after a lengthy delay, and prior to moving men and equipment from one site of work to another.

8.2.1.2 Coordinate all construction activities with:

- a. Project Inspector
- b. Contracting Officer Representative
- c. Base Fire Department
- d. Security Police
- e. Airfield Operations

8.2.1.3 Prior to the start of any construction operations whatsoever, a schedule of work or operations in proper sequence shall be submitted by the contractor for approval by the Fire Protection Branch, Security Police, Safety Office, and the Contracting Officer so as to cause a minimum amount of disruption to the normal flow of traffic on streets, pedestrian travel, base security, and facility operations.

8.2.1.4 Coordinate all Construction and Use of Premises Activities with a Contracting Officer Representative

8.2.1.5 Coordinate with Contracting Officer the scheduling and routing of work, personnel access and material deliveries for the work.

8.3 DOCUMENTATION

8.3.1 Construction Plan

8.3.1.1 Prior to the start of any onsite construction activities, the Contractor shall submit a detailed construction plan. The plan shall include a detailed schedule of the major construction activities (GANTT chart or other mutually agreeable format).

8.3.1.2 Submit to the Contracting Officer's Representative for approval, a project schedule detailing on a weekly basis when work is to begin for each major work item and what work is to be accomplished (including quantities), etc. While factors not under the Contractor's control may cause the Contractor to fall behind the schedule, the intent of the schedule is to inform the Government of planned orderly progression of the work in proper sequence. Once the schedule is approved, do not deviate from the sequence, without prior written approval.

8.3.2 Waste Disposal

7.3.2.1 Prior to the start of any onsite construction activities, the Contractor shall submit a written plan for disposing of waste materials resulting from work under this contract. If any waste material is dumped or left in an unauthorized

area, the Contractor shall remove the material and restore the area as required by the Contracting Officer.

8.4 CONSTRUCTION CONSIDERATIONS

8.4.1 Use of the Premises

8.4.1.1 Contractor shall have exclusive use of the site for construction.

8.4.1.2 Working hours for the Contractor will be Monday through Friday between the hours of 7:30 a.m. and 6:00 p.m. unless otherwise noted. No work shall be performed on Saturdays, Sundays, and Federal holidays unless otherwise stated or shown. If the Contractor wishes to work during periods other than above, permission must be requested, in writing, from the Contracting Officer at least 48 hours in advance of the desire to work during these periods.

8.4.1.3 Work may be required to be performed after normal business hours or on weekends if it is determined by the Contracting Officer that work will be disruptive to any base operations.

8.4.1.4 In general, the Contractor shall be responsible for providing portable toilet, drinking, and washing facilities for his employees and subcontractor use.

8.4.1.5 The Government will make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies. The Contractor shall carefully conserve any utilities furnished without charge.

8.4.1.6 Prior to commencement of demolition and construction, the Contractor shall coordinate daily access and egress from the area of construction with the Contracting Officer. The Contractor shall confine construction personnel and equipment travel and operations to the area of work.

8.4.1.7 Utility outages and interruptions shall be scheduled through a written request to the Contracting Officer fourteen (14) days in advance. Construction activities requiring utility outages may be required to be performed after hours or on weekends.

8.4.1.8 No utility outages will be permitted without advance written approval by the Contracting Officer.

8.4.2 Egress

8.4.2.1 Contractor shall maintain a neat and orderly workplace with clear paths of emergency egress within the construction area.

8.4.3 Storage of Materials

8.4.3.1 The Contractor shall be responsible for the storage and safekeeping of all material to be incorporated into the work. The Contractor shall be responsible for all aspects of safety and security within the storage area.

8.4.3.2 Contractor shall limit storage of materials, equipment trailer, and sheds to the site-designated staging area or within the confines of the area of work.

8.4.3.3 Provide adequate storage facilities for protection of materials and equipment. Materials and equipment shall be stored so as to ensure preservation

of their quality of fitness for Work. Perishable items and items adversely affected by weather, rain, wind, dust, heat, or cold shall be stored within the designated area of construction, temporary waterproof sheds, or mobile facilities with raised floors, and heated if necessary. Other materials and equipment shall be stored on wooden platforms and not on the ground.

8.4.3.4 Storage facilities shall be clean, in good condition, undamaged and free of rust or surface deterioration. Rental trailers shall be of a neutral color. Unsightly material storage or office trailers will not be permitted.

8.4.3.5 The Contractor shall be responsible to maintain the condition of storage facilities, as defined above, and the entire construction site in a neat, orderly, professional and uncluttered manner at all times throughout the length of the contract.

8.4.3.6 The Contractor's job site trailer shall have a professionally made metal identification sign attached in a prominent location. The sign shall be 2 ft. x 3 ft. in size (with light colored lettering on a dark colored background) indicating the Contractor name, name and 24 hour phone number of someone to contact in case of emergency.

8.4.4 Security

8.4.4.1 Security requirements shall be observed at all times. The Contractor shall be responsible for maintaining satisfactory standards of employee competency, conduct, appearance, and integrity.

8.4.4.2 Construction operations shall be strictly confined to the designated area of Work.

8.4.4.3 An identification badge will be issued for each of the Contractor's employees and subcontractors. Each employee will be required to display the badge as directed by the Contracting Officer for access to and execution of the work within this facility.

8.4.5 Protection of Personnel and Government Property

8.4.5.1 Contractor shall comply with all applicable Federal, State, and Local safety codes, regulations, and requirements.

8.4.5.2 It is the Contractor's responsibility to maintain a secure construction site to prevent access to the work area by unauthorized personnel.

8.4.5.3 Safety posters, "hard hat area" posters, "authorized personnel only" posters, and any other notifications required by law shall be posted and maintained in sufficient quantity to be conspicuous on the job site.

8.4.5.4 In the event of damages of any nature caused by this work due to improper protection, precaution or safety measures, such damages shall be repaired or the Contractor at no cost to the Government shall replace such property. In the event the Contractor does not satisfactorily repair or replace such damage caused by the work of this contract, the Government will make the necessary corrections and the Contractor shall reimburse the Government for inconveniences, labor, and materials, involved.

8.4.6 Fire protection

8.4.6.1 Fire protection shall conform to NFPA 241 and EM 385-1-1.

8.4.6.2 Fire extinguisher equipment shall be provided in storage areas according to the hazard present.

8.4.6.3 Fire extinguishers listed or approved by a nationally recognized testing laboratory shall be used.

8.4.7 Waste Disposal

8.4.7.1 The Contractor is required to maintain a clean project site free of accumulating debris. Demolition debris and other construction waste shall be promptly disposed of at the end of each workday in proper waste containers maintained on the project site by the Contractor.

8.4.7.2 Environmentally hazardous or other construction debris with special disposal requirements shall be stored on the site and disposed of off site in a proper lawful manner.

8.4.7.3 All debris shall be removed from the site on a regular basis. Waste shall not be allowed to accumulate.

8.4.7.4 Construction waste and debris maintained on-site prior to off-site disposal shall be controlled in a manner to eliminate any potential health or safety hazards.

8.4.7.5 Burning of waste or any other material on-site is strictly prohibited.

8.4.7.6 The project job site shall be "broom cleaned" at the end of each work day. The Contractor shall remove debris from the job site as it is generated and dispose of it in proper containers as outlined herein.

8.4.8 Traffic Management:

8.4.8.1 Skeel Avenue through traffic and access to the airfield must be maintained during all phases of construction for general public and emergency vehicles.

END OF SECTION